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17

Water Rights and Water Allocation

Issues and Challenges for Asia

Asian Development Bank



Water Rights and Water Allocation

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Jeremy Bird

Wouter Lincklaen Arriens

Dennis Von Custodio

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Asian Development Bank
6 ADB Avenue
Mandaluyong City
1550 Metro Manila
Philippines
Tel +63 2 632 4444
Fax +63 2 636 2444
www.adb.org

For orders, contact
Department of External Relations
Fax +63 2 636 2648
adbpub@adb.org

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Abbreviations

ADB	Asian Development Bank
AWDO	Asian Water Development Outlook
ICESCR	International Covenant on Economic, Social and Cultural Rights
IUCN	International Union for Conservation of Nature
MDG	Millennium Development Goal
NARBO	Network of Asian River Basin Organizations
NWRB	National Water Resources Board
PRC	People's Republic of China
RBO	river basin organization

NOTE

In this report, “\$” refers to US dollars.

Foreword

More than a decade ago, stakeholders—consulted for the preparation of the Asian Development Bank’s (ADB) water policy—were among the first to underscore that the water crisis affecting the region is mostly a crisis of water governance. ADB’s Water for All policy¹ emerged, therefore, as governance-oriented. Adopted in 2001 and reviewed in 2006, it aims to improve water governance across many fronts: (i) water services delivery; (ii) water resources management in river basins; and (iii) strengthening the enabling environment of policies, legislation, and institutional reforms.

The importance of improving water governance was reiterated recently in the *Asian Water Development Outlook 2007* report (AWDO) commissioned by ADB for the 1st Asia-Pacific Water Summit. Although suggesting that there is enough knowledge, technology, and expertise available in Asia to solve its existing and future water problems, AWDO concluded that

[i]f some Asian countries face a water crisis in the future, it will not be because of physical scarcity of water, but because of inadequate or inappropriate water governance, including management practices, institutional arrangements, and socio-political conditions, which leave much to be desired.²

AWDO noted that although water governance has improved in Asia, major fundamental changes are still needed in nearly all the countries in the region.

To support investments in water resources management, in 2004, ADB had taken a leading

role in establishing the Network of Asian River Basin Organizations (NARBO) to share knowledge, improve governance, and build capacity for integrated water resources management in river basins throughout Asia. NARBO now has 69 members from a range of organizations, including river basin organizations, government agencies, and regional knowledge partners.

ADB continues to be a strong supporter of NARBO’s work program from its inception, working closely with the Japan Water Agency and the ADB Institute in Tokyo. River basin management is key to ADB’s water investments in the region, where more clients are requesting that investments in water resources management be designed and implemented in a river basin context. Under ADB’s Water Financing Program 2006–2010, one of the five targeted outcomes is the introduction of integrated water resources management in 25 river basins across the region.

In a 2004 training needs survey, NARBO members ranked water rights and water allocation as their first priority. In response, a special program was initiated in 2005 in partnership with NARBO members from Indonesia, the Lao People’s Democratic Republic, Philippines, Sri Lanka, Thailand, and Viet Nam. Over the following years, representatives of national governments and basin organizations met in a sequence of four workshops in Hanoi, Manila, Bangkok, and Saitama³ to discuss each participating country’s status regarding water allocation and water rights issues, to clarify problems, and to identify actions and recommendations to improve their situations.

Introducing water rights is a challenge facing both developed and developing countries around

¹ ADB. 2007. *Water for All: The Water Policy of the Asian Development Bank*. Manila.

² ADB. 2007. *Asian Water Development Outlook 2007*. Manila.

³ Hanoi: 5–9 December 2005, organized by the Red River Basin Organization; Manila: 5–9 June 2006, organized by the National Water Resources Board and Laguna Lake Development Authority; Bangkok: 27 November–1 December 2006, organized by the Department of Water Resources, Ministry of Natural Resources and Environment; and Saitama: 22–26 January 2007, organized by the Japan Water Agency.

the world. In industrialized countries, water rights have been a key tenet of water policies in the development process. For example, Japan moved from a sector approach to a basin perspective when it adopted the “one basin–one permitter” principle in 1964, thus modernizing its earlier water rights system under the 1896 River Law.

With economic development, population growth, and rapid urbanization comes increased pressure on water resources in terms of the quantity of available water and the ever-changing mix of stakeholder groups seeking to use the resource. The process is often accompanied by deteriorating quality of water, thus adding a further constraint to the quantity of available usable water. Superimposed upon these pressures is an imbalance of power among users (e.g., between urban and rural, industrial and agricultural, and emerging middle classes and the poor). Traditional or customary users of water also tend to be caught up in the changing pattern of water use—usually with negative outcomes.

Why are water rights and a consistent system of water allocation important? In short, the answer is security. For the rural and urban poor, as with other users, water rights relate to the security of having a basic supply necessary for a healthy and dignified life. Beyond water for domestic use, there is security in subsistence agriculture through water for cultivating basic crops and rearing livestock on which villagers depend. For those with more land, water provides the security to invest labor and money into development. For urban dwellers, the security of a more advanced lifestyle inevitably involves higher rates of water use. For industrial and commercial users, it relates to a secure investment climate for business development plans. In the absence of clearly articulated water rights, there is a risk that the security of water for these purposes will be compromised, and lives and livelihoods adversely affected.

Water rights and water allocation systems play a significant role in providing these kinds of security and addressing real challenges, such as how water is assigned to new urban and industrial development in cases of water shortage and how

the water use of existing users can be protected to safeguard their livelihoods.

Each country participating in NARBO’s water rights workshops is facing similar challenges—challenges that even developed economies continue to face. However, the main competitors for water may be different for each country and, indeed, within different parts of the same country. For example, in parts of Sri Lanka, there are tensions between storage for hydropower generation and the release of water for agriculture and urban water supply. In Indonesia, Philippines, and Thailand, the main constraint is providing water for urban, industrial, and agricultural development in areas surrounding the megacities of Jakarta, Manila, and Bangkok. Water shortage is generally not acute in the Lao People’s Democratic Republic, but a number of hydropower concessions involve river diversions that raise potential problems for customary and existing users of water. Underlying such sector competition for water are the needs of the environment and extensive rural livelihoods that rivers and groundwater systems support.

ADB’s Water for All policy promotes the establishment of a legal framework for water allocation that embodies the principles of protecting rights of the poor and ensuring transparency in decision making. It promotes integrated water resources management within the context of river basins “to maximize economic benefits and social welfare in an equitable manner without compromising the sustainability of vital environmental systems.”⁴ In encouraging the introduction of water entitlements or use rights, ADB’s policy recognizes that there are several alternative management approaches to achieve the outcome of equitable distribution.

A 2006 independent review of the implementation of this policy commented that although ADB has been instrumental in promoting water policy and institutional reform, the “effectiveness of the new laws and water policies in some countries has been constrained by weak legal and regulatory frameworks and institutions.”⁵ Among the recommendations of the independent

⁴ Footnote 1, p. 17.

⁵ ADB. 2006. *Water for All: Translating Policy into Action. Independent Panel Report of ADB’s Water Policy Implementation*. Manila, p. 13.

review panel was a call for improved water governance and ADB's continued support for this goal (footnote 5).

In May 2007, NARBO and ADB cosponsored another workshop on water rights to synthesize the results of the earlier four workshops on water allocation and water rights and to explore the challenges associated with water rights. Participants reflected the complexities of water rights and the importance of ensuring that a system is suited to the local context, is practicable, and is enforceable. A key conclusion of the workshop was that the process of introducing and implementing a countrywide licensing system for water-use rights may take 20 years to complete. Making clear arrangements for practical solutions in the transition phase is, therefore, the most important and urgent task, and these arrangements need to be flexible enough to respond to changing needs in water management as a result of continuing urbanization, climate change, and other drivers of change.

This report builds on the foundation of the five NARBO workshops on water rights. The draft was presented to the 3rd NARBO General Meeting in Solo, Indonesia in February 2008, and was finalized with comments from that meeting. The report aims to (i) provide practical clarity on the concepts and terminology surrounding water rights and water allocation, (ii) summarize key findings from the cross-country comparisons made during the four workshops held between 2005 and 2007, (iii) stimulate in-depth discussion on water rights and identify ways to overcome the challenges of their implementation, and (iv) provide inputs for future NARBO and ADB activities to assist governments in the region in improving water rights and water allocation in the context of integrated water resources management.

I express my sincere thanks to the authors for compiling this report; to the workshop participants from countries in the region for sharing their experience and advice in the process; and to our partners from the Japan Water Agency for their valuable inputs, especially to Michitaro Nakai, Michio Ota, and Hiroyuki Shindou. The valuable inputs by several ADB colleagues through comments and peer review, including Mari Jennifer Bruce, Eveline Fischer, Christophe Gautrot, Ian Makin, Christopher Morris, Kala Mulqueeney, Lyailya Nazarbekova, and Kenichi Yokoyama, are gratefully acknowledged; as are the helpful editorial and administrative support by Melissa Alipalo, Christina Duenas, Gino Pascua, and Eileen Santos.

I recommend this report as a resource for staff working in water agencies and river basin organizations that have already joined NARBO as members, as well as for other interested parties—both in government and civil society—who are considering adopting a water rights system, especially those in ADB member countries.

ADB Water Community of Practice staff members look forward to further collaboration with our clients and partners in this and other challenges of improving water governance, as part of the work in our Water Financing Program.

Xianbin Yao
Director General
Regional and Sustainable Development
Department
Asian Development Bank

Introduction: The Role of River Basin Organizations in Water Rights and Allocation

The primary audience for this report is management and staff working in water resources agencies in Asia, particularly those in river basin organizations (RBOs) in their various forms. The roles and responsibilities of RBOs vary considerably and are evolving as pressures on water resources are becoming more severe. Although this report seeks to share knowledge about the fundamentals and application of water rights and allocation, it attempts to do so with a practical focus.

River basin organizations can help avoid and solve problems in basins and build enabling environments for integrated water resource management, including water rights and allocation.

This introduction raises three basic issues to keep in mind when considering RBOs' roles in water rights and allocation: (i) how RBOs can help avoid problems occurring in basins, (ii) how RBOs can help solve problems in basins, and (iii) how RBOs can help build enabling environments for integrated water resources management (IWRM) in basins.

The focus on water rights in this report is mainly on the distribution, supply, and use of water, including environmental use. Regulatory systems relating to the discharge of wastewater are covered in other texts on environmental legislation. There are, however, clear links between water quality and its availability, and they will intensify as pressures on water sources increase. RBOs will play an important role in coordinating institutional responsibilities and advising on the related aspects of water allocation and measures to protect the quality of the resource.

RIVER BASIN ORGANIZATIONS CAN AVOID PROBLEMS IN BASINS

Minimizing conflicts over water use. Conflicts over scarce resources have many origins, e.g., the refusal of an application for water use, an imposed change or restriction placed on an approved use, upstream pollution, or a violation of conditions of water use by another user. These conflicts are intensified during periods of shortage or drought, and RBOs can facilitate coordination, foster cooperation, and avoid conflicts. The establishment of a basin council with representatives from affected stakeholders can itself be a powerful instrument in this regard. In Europe, Asia, and Africa, international transboundary RBOs⁶ have helped develop mutual understanding among those in riparian countries, thereby reducing the likelihood of conflicts. The Mekong River Commission has established rules that govern mainstream river development to minimize potential conflict among water abstraction, salinity intrusion, and livelihoods based on fisheries.

“Done right, water rights can secure access to water for existing users and offer equitable ways to meet additional water needs, including urban expansion, economic growth and environmental protection”
(Bruns 2005 p. 283).

Reallocating water-use rights. Rapid population growth, urbanization, and industrial transformation have led to a number of challenges for water allocation and water rights in megacities such as Bangkok, Jakarta, and Manila. Often these conditions require a de facto transfer from agriculture use to municipal, commercial, or

⁶ Examples of transboundary RBOs include the International Commission for the Protection of the Danube River; the International Commission for the Hydrology of the Rhine Basin; the Mekong River Commission; and several RBOs in Africa, including the Gambia RBO and Okavango River Basin Commission.

industrial use. RBOs can facilitate such transfers and help identify win-win solutions.

RIVER BASIN ORGANIZATIONS CAN SOLVE PROBLEMS IN BASINS

Resolving conflicts over water use. Whenever a regulatory framework for water rights is in place, there will be conflicts over its implementation. When conflicts do arise, RBOs can help resolve them. For example, in Brazil, river basin committees arbitrate conflicts relating to water resources as the first administrative recourse. In addition, RBOs can take action against illegal water use. In Spain, RBOs that have jurisdiction can monitor and prosecute illegal water use, including unauthorized wells, surface water intakes, and greater-than-assigned water volume on farms. In the United States, the Delaware River Basin Commission and the Susquehanna River Basin Commission address disputes over water, first through consultation and negotiation instead of through litigation.⁷

Alleviating water shortages. Many river basins in Asia are now experiencing competition for water resources, especially in the dry season. Prolonged drought conditions intensify the challenges of water allocation. RBOs with the authority to develop and operate water resources can help deliver the necessary supplies of water to meet the demands and match water entitlements. The Japan Water Agency and K-Water (formerly Korea Water Resources Corporation) have a long history of developing and managing water resources and providing water for domestic, industrial, and agricultural purposes. Beyond providing additional supply, there are economic and environmental benefits from introducing demand-side management and supply-side efficiency improvements—e.g., in the People's Republic of China (PRC), the benefits from trading water savings that are generated by more efficient

water-use practices. Drought conciliation councils in Japan have also been effective in reaching consensus on water restrictions during water shortages.

Improving water quality. Many river basins in Asia are severely polluted, which further reduces the availability of water for productive use and environmental services. RBOs can help rehabilitate river systems from highly polluted to healthy rivers. The Yellow River Conservancy Commission in the PRC promotes the “healthy life of the Yellow River” through administrative, legal, technological, engineering, and economic measures captured in a new Yellow River Law (Box 5). In the United States, the Tennessee Valley Authority works with local communities to improve watershed management and eliminate nonpoint source pollution. The Murray–Darling Basin Commission in Australia manages salinity and nutrient levels to reduce algal blooms and to relieve strain on the aquatic ecosystem.

RIVER BASIN ORGANIZATIONS CAN HELP BUILD AN ENABLING ENVIRONMENT FOR INTEGRATED WATER RESOURCES MANAGEMENT

Improving river basin planning. Comprehensive basin planning is a key element of IWRM. However, the notion that each basin should have only one plan is rapidly becoming outdated in an era of decentralized responsibilities. Planning that affects water resources across a basin is now taking place at many levels and by a multitude of actors. RBOs can add value by analyzing, updating, and harmonizing existing plans. They also can produce an overall strategic basin plan that sets medium- and long-term objectives and provides a synthesis of ongoing planning efforts. RBOs can act as facilitators to make sure that stakeholders from all sectors are included in the planning process.

⁷ For the Delaware River Basin Commission, see www.state.nj.us/drbc/ and Collier, C.R. 2004. *The DBRC: Managing Interstate Conflicts through Sound Science, Adaptation and Collaboration*. www.state.nj.us/drbc/FisheriesOpEd-July2004.pdf. The third goal of the Susquehanna River Basin Commission is “to coordinate management of interstate water resources and serve as an effective forum for resolution of water resource issues and controversies within the basin.” See www.srb.net/about/geninfo.htm

Developing guidelines, rules, and regulations.

Rules, regulations, and implementing decrees at the basin or national level provide substantive guidance for carrying out provisions of the law. RBOs can clarify the details of implementing basic water rights and the process of allocating water-use rights.

Developing decision support information.

Accurate information to facilitate decision making in water resources management is essential. RBOs can improve decision support information for IWRM policy, planning, and decision making in river basins.

OUTLINE OF THE REPORT

This report aims to raise awareness and capacity among members of the Network of Asian River Basin Organizations (NARBO) and other interested groups on the issues surrounding water rights and allocation. This introductory section, in particular, looks at the subject through the lens of RBOs in their many different forms. In reading the body of the paper, the role of RBOs in avoiding problems, solving problems, and building a better enabling environment for IWRM should be kept in mind. It is a process that experience has shown can take many years.

Part 1: The Principles and Priorities of Water Rights

UNDERSTANDING THE TERMINOLOGY: WATER RIGHTS, ALLOCATION, AND WATER-USE RIGHTS

A “water right” is defined as the “right to take and use water subject to the terms and conditions of the grant” (Burchi and D’Andrea 2003). It is also considered as a formal or informal entitlement, which confers on the holder the right to withdraw water (World Wide Fund for Nature 2007). This report focuses on two basic categories of water rights. The first is a “basic water right” that people have as a consequence of primary legislation, which is permanent and not subject to any administrative process. The second is a “water-use right” conferred through an administrative process of water allocation, such as licensing. Water-use rights or authorized uses of water are discussed further in part 2.

“Water allocation” is the process in which an available water resource is distributed (or

redistributed) to legitimate claimants. The resulting authorization for use is granted, transferred, reviewed, and adapted as a “water-use right.” Priorities for allocating water can be defined in law or through strategy development or planning processes.

Burchi and D’Andrea (2003) defined “water allocation” as “the function of assigning water from a given source to a given user or number of users for abstracting it and applying it to a given use.” They note that within a system, where the state is responsible for a country’s water resources, the decision of who should abstract water and for what use rests with a public authority.⁸

In a 2007 paper on water rights and water allocation, the World Wide Fund for Nature defined water allocation as a process whereby an available water resource is distributed to legitimate claimants and the resulting water rights are granted, transferred, reviewed, and adapted. Hence, water allocation processes generate a series of water rights governing the use of water within a catchment.

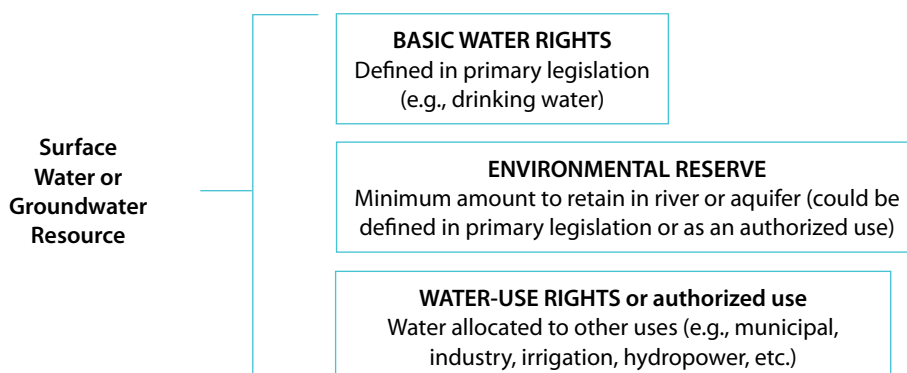
Figure 1 distinguishes “basic” water rights, such as those defined in primary legislation for basic human needs, from “allocated” water-use rights (or usufruct rights) that are decided through a defined administrative process. The middle row of the figure represents the “reserved” amount of the water resource that is to be retained in the river or aquifer for environmental or other sustainability-related downstream purposes. Such environmental reserves may either be legislated as a basic right, as in the case of South Africa (Box 1), or decided administratively through the water resources planning process.

A water right is the right to take and use water subject to the terms and conditions of the grant. It is a formal or informal entitlement, which confers on the holder the right to withdraw water.

Water-use rights are conferred through an administrative process of water allocation, such as licensing.

Water allocation is the process in which an available water resource is distributed (or redistributed) to legitimate claimants.

⁸ Burchi and D’Andrea refer to another set of rules for allocating water that “belongs” to an individual or corporation, known as “user-controlled” rules. These are governed by rules of neighborliness and specific bodies of rules developed in the courts, such as riparianism and prior appropriation. They note that “user-controlled” allocation decisions represent an ever-shrinking minority of water allocation decisions because of wider government intervention in the growing complexity of water resources management (pp. 3–4).

Figure 1: Water Rights, Environmental Reserve, and Water-Use Rights**Box 1: South Africa Legislates Universal Access to Water as a Right**

The International Union for Conservation of Nature (IUCN) reviewed 60 national constitutions and found that only South Africa's 1996 Constitution, in article 27, expressly enshrined a fundamental right of access to sufficient water (IUCN 2004, p. 9).

This right appeared as one of the main objectives of the 1997 National Water Services Act: "the right of access to basic water supply and the right to basic sanitation necessary to secure sufficient water and an environment not harmful to human health or well-being."^a Regulations under this act defined the minimum standard for basic

water supply as 25 liters of potable water per person per day.^b This is an absolute right of access defined in primary legislation and is therefore not subject to allocation procedures.

In addition, the 1998 National Water Act (sec. 16)^c assigned a reserve for basic human needs and also contained a legislated right for an ecosystem reserve. Further uses of water for reasonable domestic use are described as "permissible uses," as defined in schedule 1 of the act, but they are not defined as rights, and the government is not obligated in the same way to supply this water.

^a The term "basic water supply" is defined in the National Water Services Act as "the prescribed minimum supply of water supply services necessary for the reliable supply of a sufficient quantity and quality of water to households, including informal households, to support life and personal hygiene" (sec. 1[iii]).

^b "The minimum standard for basic water supply services is (a) the provision of appropriate education in respect of efficient water use; and (b) a minimum quantity of potable water of 25 litres per person per day or 6 kiloliters per household per month—(i) at a minimum flow rate of not less than 10 litres per minute; (ii) within 200 metres of a household; and (iii) with an effectiveness such that no consumer is without a supply for more than seven full days in any year" (Regulation Relating to Compulsory National Standards and Measures to Conserve Water, 2001, sec. 3).

^c The basic human needs element of the reserve is defined as "the quantity and quality of water required to satisfy (a) basic human needs by securing a basic water supply...for people who are now or will, in the reasonably near future, be (i) relying upon; (ii) taking water from; or (iii) being supplied from, the relevant water resource" (South Africa, National Water Act, 1998, sec. 1[1][xviii]).

Basic water rights generally amount to a very small percentage of overall water resources, whereas water resources allocated for municipal, industrial, or irrigation uses are generally far larger. In most Asian countries, agriculture is the biggest user of water and can reach up to 90% of total water consumption.⁹ The environmental

reserve is sometimes quoted as a simple percentage of minimum flow, but in practice needs more specific definition because it comprises a complex

Basic water rights generally amount to a very small percentage of the overall water resource.

⁹ At an estimated 2,500 cubic kilometers (km³) per year, water use for agriculture is in the order of 70% of total water withdrawals (World Commission on Water 2000). In terms of scale, if 25 liters per capita per day is assumed as the basic human need for the world's population of approximately 6 billion, this amounts to 54 billion km³, or 2% of that withdrawn by agriculture.

pattern of seasonally managed flows tailored to the environmental objectives in each location.

Priorities for domestic consumption appear in water legislation of other countries, but rarely is the right of access for basic human needs so explicit as in the case of South Africa. Table 1 compares how different countries prioritize water use in their national water legislation. Indonesia's Water Resources Law (Law No. 7/2004) is close to defining water for basic needs as a basic water right by establishing the state's responsibility to guarantee water for rudimentary needs. The clarification of the law, however, further explains that the state is obliged to carry out various efforts to guarantee water availability for every person. By stating it in this manner, the emphasis is placed on the state's actions instead of the outcome. In article 48 of the National Water Law of the People's Republic of China (2002), domestic consumption by households is exempt from licensing requirements as well as drinking water for scattered or penned livestock and poultry. Defining priorities in this way is important but stops short of including a right of access to water for basic human needs. It implies a more passive approach to providing water for people's basic needs, compared with the more proactive case

of South Africa, in which basic needs is the first consideration in the water allocation process.

IMPLICIT AND EXPLICIT ALLOCATION SYSTEMS

Beyond having access to water for meeting domestic needs, what rights do individuals or organizations have to water for urban consumption, irrigation, industrial production, commerce, generating electricity, or navigation? How are such uses authorized? In general, two approaches are used to define these rights:

- Implicit.** Historically, allocation has been provided through top-down, government-driven planning processes in which the quantities of water for specific development projects are determined and then become accepted practice. In such cases, users have only limited security in the form of rights and do not have opportunities for redress when water is reallocated for another use. In this report, this system is categorized

Table 1: Examples of Water-Use Priorities Defined in National Legislation

Country	Priorities Conferred Explicitly in Legislation
Cambodia	Drinking, washing, bathing, and other domestic purposes; watering of domestic animals and buffaloes; fishing and irrigation of gardens and orchards in an amount not exceeding that necessary to satisfy individual and family needs of the user (Law on Water Resources Management 2007, art. 12).
People's Republic of China	The development and utilization of water resources shall first satisfy the domestic need of urban and rural inhabitants and give overall consideration to the agricultural, industrial, and ecological environment need for water as well as to the need of navigation (2002 National Water Law, art. 21).
Indonesia	The state guarantees the right of every person in obtaining water for minimum rudimentary daily use to fulfill a healthy, clean and productive life (Water Resources Law, Law No. 7/2004, art. 5).
South Africa	The first priority in South Africa's National Water Act is the reserve, defined as the quantity and quality of water required: <ol style="list-style-type: none"> to satisfy basic human needs by securing a basic water supply, as prescribed in the 1997 Water Services Act, for people who are now or who will in the reasonably near future be relying upon, taking water from, or being supplied from the relevant water source; and to protect aquatic ecosystems in order to secure ecologically sustainable development and the use of the relevant water resource (National Water Act, art. 1 [1][xviii]).

as a form of an implicit allocation system. A more participatory approach, also considered as an implicit or administrative system, is the seasonal negotiation of water allocation adopted in Sri Lanka (Box 2).

- **Explicit.** The second (and increasingly more frequent) approach is allocation through a system of time-bound licenses or permits to specific users, whose supply is then secured for a defined quantity of water for a stated period. Such systems are categorized in this paper as an explicit allocation system. One of the earliest explicit licensing systems in Asia was introduced by the Philippines in 1976 (Box 3).

These two approaches are discussed in more detail in part 2.

*In an **implicit allocation** system, users have only limited security in the form of rights and do not have opportunities for redress when water is reallocated for another use. An **explicit allocation** system provides time-bound licenses or permits to specific users, whose supply is then secured for a defined quantity of water for a stated period.*

Owning land adjacent to surface water may generate expectations regarding its use. In the United States, for example, the right to use water under the conventional riparian rights system is intimately linked to the land.¹⁰ In most countries, however, major surface water abstractions, such as for commercial irrigation, are regulated explicitly through water licensing systems. In the PRC, state

Box 2: Sri Lanka—an Implicit Approach

Sri Lanka developed a comprehensive system for seasonal allocation of bulk water flows from the Mahaweli river system.^a With progressive development of dams, river diversions, and canal systems since the 1970s, the Mahaweli system covers 2.6 million hectares, equivalent to approximately 39% of the country's land area. Each season, water demands from agriculture, hydropower, and urban centers are received from sector agencies. The environmental need is considered to be part of these allocations. When calculating the water demands from each sector from the system's bottom to the top, a certain percentage is added based on stream/river parameters to cover transmission losses and environmental needs. A range of options is prepared based on rainfall projections, and they are discussed at the preseason *kanna* (water management) meetings, with representatives of local and central government agencies, hydropower and water supply utilities, and farmer representatives.

There is generally enough water for full irrigation during the wet, or *maha*, season, but only partially for part of the land during the dry, or *yala*, season. Once an agreement is reached on allocations at the main or "block" levels, similar discussions take place to determine distribution patterns within irrigation systems, including

some traditional approaches, for sharing the scarce resource and the associated risks among irrigators. Once ratified by the minister, the allocation plan takes on a formal commitment. Variations might be needed during the season to reflect climatic fluctuations, and weekly meetings are held to review allocation targets based on rainfall and reservoir levels. Adjustments or rationing are made where necessary.

The system is based extensively on past experience, which provides a degree of confidence among water users even though they have no long-term right to a nominal fixed amount of water. It also provides a formalized system for dealing with seasonal fluctuations, although there can be no guarantee that allocations will not need to be cut during the season in response to drought conditions.

This approach can be classified as an implicit allocation system that has some formal sanctions and in which the priorities to be applied in drought conditions are well known. No expansion of supply to urban or industrial sectors is sanctioned if it affects existing users. Improving water management is one option, but if the required need is still not met, relevant agencies will promote new water sources, including groundwater.

^a See www.mahaweli.gov.lk/

¹⁰ For a description of the riparian system, see Getches 1997.

Water rights institutions play an increasing role in controlling surface water, but so far have had less impact on aquifer management (Bruns 2005, p. 290).

ownership and regulation of water apply equally to both surface water and groundwater; although this is not generally the norm for the region; instead, most

countries do not regulate groundwater abstraction on privately owned land.¹¹ In Pakistan, surface water is highly regulated through a major network of river barrages and canals designed to supply an equitable share of the water, whereas the right to abstract groundwater is closely linked to land ownership.¹² Bruns (2005) stressed that effectiveness of a rights system is only as good as the institutions responsible for implementing them (Bruns 2005, p. 6).

Box 3: Philippines—an Explicit Approach

The Philippines established an explicit licensing system in the 1970s under the Philippine Water Code (Presidential Decree No. 1067, 1976). The country's apex body for the water sector, the National Water Resources Board (NWRB),^a is responsible for implementing the licensing system. Due to a number of challenges in implementing the system, however, only 35% of users who should have water permits actually have them. NWRB has been working to improve the system's implementation and expand the low coverage rate.

Appropriation of water for a defined purpose is allowed only after a user has secured a water permit (art. 13). Such a water-use right is described as a "privilege." Water permits are not time-limited, but a provision exists to revoke the permit in the case of noncompliance with conditions—including if the water is not used for the approved use. Modifications are also possible when a more beneficial use for the water is identified, in which case the permit holder may claim compensation for any loss.^b Exemptions are granted to landowners for domestic use of water, although in some cases this may need to be registered (art. 6). Another progressive aspect of the Water Code is bringing responsibility for allocation of both surface water and groundwater under a single agency, NWRB.

Despite the Water Code being well-designed, its implementation still faces major challenges, as reflected in the low level of permit coverage after 30 years of the

law. Reasons include lack of awareness, illegal water use, resource limitations within NWRB, poor interagency coordination, the relatively short period of 2 years for registering existing use, and lengthy application procedures for permits.

To combat a lack of regional representation and limited human resources, NWRB has started to institutionalize a countrywide information, education, and communications campaign on water rights and permits. The campaign has involved posting information on NWRB's website (www.nwrb.gov.ph); conducting countrywide consultations; and distributing materials on water permit application processes through primers, brochures, and CDs in various local dialects. To further improve the system, NWRB is currently proposing some amendments to pertinent provisions of the Water Code to address conflicts with other laws and to strengthen coordination and streamline functions of various government agencies involved. NWRB has also started to implement the regulations strictly by (i) issuing cease-and-desist orders against violators, (ii) strengthening NWRB deputized agents, (iii) imposing penalties (including cancellation of permits), and (iv) granting compensation schemes. With assistance from local government units and other government agencies, NWRB has improved the coverage of water permit issuance considerably.

^a See www.nwrb.gov.ph/

^b A permit issued under the Water Code may be suspended on the grounds of noncompliance with approved plans and specifications or schedule of water distribution, use of water for a purpose other than for which it was granted, or nonpayment of water charges (art. 28). It may also be revoked after due notice and hearing on grounds of nonuse or gross violation of the conditions imposed in the permit (art. 29). All water permits are "subject to modification or cancellation by the board, after due notice and hearing, in favor of a project of greater beneficial use or for multipurpose development, and a water permittee who suffers thereby shall be duly compensated by the entity or person in whose favor the cancellation was made" (art. 30).

¹¹ Article 3 states, "[w]ater resources shall be owned by the state" where under Article 2, "water resources referred to in this Law includes surface water and groundwater."

¹² Only Balochistan has passed legislation to control groundwater development and overabstraction through licensing provisions, although this has not been effective in practice. The 1978 Groundwater Rights Administration Ordinance was promulgated "to regulate the use of groundwater and to administer the rights of the various persons therein." In other areas, federal and provincial actions have been taken to control waterlogging and salinity.

ENSURING ACCESS FOR THE POOR

With the adoption of the Millennium Development Goals (MDGs), the target of halving the population without sustainable access to safe drinking water and improved sanitation by 2015 has taken center stage in countries around the world. At the 3rd World Water Forum in Japan in 2003, the Asian Development Bank (ADB) and its partners showed that water and poverty are connected in both vicious and virtuous cycles. ADB and its partners called for more attention to broad-based as well as targeted water investments to reducing poverty (Soussan and Lincklaen Arriens 2004). At the 4th World Water Forum in Mexico in 2006, this understanding was reconfirmed in a multiagency paper by the Poverty and Environment Partnership (Stockholm Environment Institute and United Nations Development Programme 2006).

Regardless of financial questions, there is a strong case for protecting small farmers' water rights, particularly in areas where development change is expected, to ensure that their interests are fully recognized in any change process.

Parallel to the global efforts to increase water investments for poverty reduction, the debate over whether water is a human right has gathered momentum in the past decade and attracted considerable attention from activists, academics, and the United Nations.¹³ Much of the discussion centers on the interpretation of the International Covenant on Civil and Political Rights that incorporates the “right to life” in article 6(1)¹⁴ and

the International Covenant on Economic, Social and Cultural Rights (ICESCR) that recognizes the right of everyone to an adequate standard of living, including adequate food, freedom from hunger (art. 11), and the right to enjoy the highest standard of physical health (art. 12).¹⁵

The United Nations Committee on Economic, Social and Cultural Rights offered further interpretation of the role that the ICESCR gave to water. In its General Comment No. 15 in 2002, the committee stated:¹⁶

The human right to water is indispensable for leading a life in human dignity. It is a pre-requisite for the realization of other human rights (para. 1).

The human right to water entitles everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses (para. 2).

The right to water clearly falls within the category of guarantees essential for securing an adequate standard of living, particularly since it is one of the most fundamental conditions for survival (para. 3).

Although countries must work toward achieving ICESCR articles 11 and 12, there is no immediate obligation. The committee's General Comment No. 15 is not a legally binding agreement among United Nations members, and countries are not obligated to recognize water as a right.¹⁷

General Comment No. 15 noted that recognizing water as a human right would impose three obligations on countries:

¹³ See, for example, Gleick (1999), IUCN (2004), and the World Bank's publication by Salman and McInerney-Lankford (2004).

¹⁴ International Covenant on Civil and Political Rights, adopted on 16 December 1966, entered into force 23 March 1976, G.A. Res. 2200A (XXI), UN doc. A/6316 (1966), 99 UNTS 171, reprinted in 6 ILM 369 (1967). Article 6(1) stated that “[e]very citizen has the inherent right to life. This right shall be protected by law.”

¹⁵ International Covenant on Economic, Social and Cultural Rights, adopted on 16 December 1966, entered into force 3 January 1976, G.A. Res. 2200A (XXI), UN doc. A/6316 (1966), 993 UNTS 2, reprinted in 6 ILM 360.

¹⁶ United Nations Economic and Social Council, Committee on Economic Social and Cultural Rights, General Comment No. 15 (2002). Twenty-ninth session, Geneva, 11–29 November 2002. E/C.12/2002/11. <http://193.194.138.190/html/menu2/6/gc15.doc>

¹⁷ The committee does not have power to create new obligations, but instead to provide interpretation of existing obligations of the ICESCR. Under the ICESCR, member states have committed to take steps “with a view to achieving progressively the full realisation of the rights recognised in the present Covenant by all appropriate means, including particularly the adoption of legislative measures” (art. 2[1]).

- to respect the right, i.e., refrain from any activity that interferes with enjoyment of that right;
- to protect the right, i.e., prevent interference by third parties; and
- to fulfill the right, i.e., to adopt the necessary measures to provide water, including the legislative framework, strategy, and action plans.

The committee maintained that a right to water is subject to the following three tests:

- accessibility, i.e., within safe physical reach, affordable for all, accessible to all, including the vulnerable;
- adequate quality, i.e., water for personal and domestic use must be safe; and
- quantity or availability, i.e., sufficient and continuous for personal and domestic use.

It is important also to differentiate between an absolute right to water, as proposed in the interpretation of General Comment No. 15, and the “right of access” to water as embodied in the MDGs.¹⁸ The right of access to water is a less onerous commitment for countries and is more open to interpretation regarding responsibility for attaining such access. For example, would it be sufficient for a country merely to embody the right of access in national legislation without any obligation on the part of a government to actually fulfill the provision of water through strategies and action plans? Although most countries have subscribed to the MDGs, the MDGs themselves do not form a legal commitment.

General Comment No. 15 also distinguished freedoms from entitlements:

The freedoms include the right to maintain access to existing water supplies necessary for the right to water, and the right to be free from interference, such as the right to be free from arbitrary disconnections or contamination of water supplies. By

contrast, the entitlements include the right to a system of water supply and management that provides equality of opportunity for people to enjoy the right to water (para. 10).

In terms of priorities, the ICESCR stated:

Priority in the allocation of water must be given to the right to water for personal and domestic uses. Priority should also be given to the water resources required to prevent starvation and disease, as well as water required to meet the core obligations of each of the Covenant rights (para. 6).

Beyond providing enough water for drinking and basic human needs, there is a strong argument in countries with significant rural populations to protect water required for subsistence farming as, for example, is done in the definition of priorities in Indonesia’s Water Resources Law (see Appendix 2). Water rights for small-scale or noncommercial agriculture are an emotive and political topic and raise issues on water pricing and cost recovery. These are country- and context-specific issues. Regardless of the financial questions, there is a strong case for protecting the water rights of small farmers, particularly in areas where development change is expected, to ensure that their interests are fully recognized in any change process.

PROTECTING CUSTOMARY RIGHTS IN MODERN WATER LAW

The link to property rights is also at the heart of customary uses of water. Traditional patterns and conventions of water use are closely tied to the land of indigenous and native communities that may or may not have formal land ownership title under prevailing land law. Past developments have frequently compromised such customary uses, although today there is greater recognition of their role and importance. The water rights of these

¹⁸ MDG Target 10 aims to “halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation.” See www.undp.org/mdg/goallist.shtml. Note the sanitation target was added at the World Summit on Sustainable Development in 2002.

communities have evolved from small abstractions from rivers adjacent to land, to water distribution through man-made conveyance systems from reservoir storage or rivers tens or hundreds of kilometers away.

In a recent discussion paper on the interface between customary and statutory rights, Burchi (2005) noted that

[i]n the countries where customary rules play a significant role, particularly in the rural areas, customary law and customary water rights are a factor to be reckoned with when preparing “modern” legislation regulating the abstraction and use of water resources through government permits or licenses. From a statutory perspective, the two water rights systems intersect and interact in the transitional phase following enactment of new water legislation, and in the course of administering the latter’s abstraction licensing regulatory provisions.

As indicated later in Table 3, there is limited recognition of customary water rights in the

The lack of explicit protection for traditional water-use rights in water law tends to confirm the limited awareness of this issue and the lack of influence that indigenous people have.

primary water legislation of countries that participated in the NARBO water rights workshop series. Only Indonesia’s Water Resources Law explicitly protects traditional communal rights (Box 4). Although other legislation can provide some protection of indigenous peoples—for instance, in the case of resettlement under land laws—the lack of explicit protection to traditional water-use rights in a water law tends to confirm the limited awareness of this issue and lack of influence that such groups have. The Philippines Indigenous Peoples Rights Act of 1997 (Republic Act No. 8371) does provide greater protection and grants indigenous communities the right to benefit and share the profits from the allocation and utilization of water resources (Box 4).¹⁹ Similar motivations inspired a groundbreaking agreement on new development between Hydro-Québec and the Cree Nation in Canada (Box 4).

Box 4: Protecting Customary Rights in Modern Water Law

Indonesia Reflects Communal Rights in Its Water Resources Law

Traditional communal water rights are acknowledged in the Water Resources Law and can be continued, provided that they do not conflict with other provisions of the law (art. 6[2]). Traditional uses need to comply with local regional regulations and the principles that comprise traditional community law. The licensing guidelines also cover existing traditional communal rights.

Philippine Indigenous Peoples Rights Act of 1997 Protects Traditional Water-Use Practices

The Water Code does not expressly protect customary rights to water; it requires that any existing use be registered within 2 years of the code’s enactment. Very few, if any, customary rights of indigenous peoples were registered during that period. Passage of the Indigenous Peoples Rights Act of 1997 provided greater protection

for traditional water-use practices of indigenous communities by requiring their free and prior informed consent for any development proposal affecting them.

Hydropower Development in Quebec is Based on a Partnership Approach

Hydropower, forestry, and mining development have long been controversial issues for the Cree Nation in Quebec. As part of a benefit-sharing arrangement with the Government of Quebec (*La Paix des Braves*), the Cree Nation agreed to certain project developments in these sectors. The agreement moved away from an approach based on compensation, damages, and exchange or surrender of rights toward one based on a clear recognition of the Cree Nation’s right to resources. The agreement includes their involvement in decisions over hydropower development that could otherwise adversely affect their use of water resources.

Source: United Nations Environment Programme Dams and Development Project.

¹⁹ Republic Act No. 8371, section 17 states: “They shall participate in the formulation, implementation and evaluation of policies, plans and programs for national, regional and local development which may directly affect them” and section 7(c) provides for the principle of free and prior informed consent to any proposal to relocate indigenous people from their ancestral domains. Other similar provisions protect their use of natural resources in such domains.

SAFEGUARDING ENVIRONMENTAL USES OF WATER

Related to the previous discussion about the debate over water as a human right, IUCN makes the point that the environment's need for adequate levels of quality water is linked to providing safe drinking water and safeguarding livelihoods and social systems, as they are dependent on aquatic ecosystems. This position is central to the principles of IWRM and goes beyond the narrower considerations of biodiversity conservation. "Management of water is not merely about managing water in-stream, but about the health of the land and the ecosystem" (IUCN 2004, p. 27).

Many water laws include general provisions to promote sustainability and protection of the environment and contain specific requirements for pollution control. However, water laws do not usually explicitly call for the protection of the environment's right to water (or, in other words, the need to retain a certain flow of water in rivers or to set maximum depletion limits on groundwater aquifers). Box 5 shows a summary of how some national legislations treat the environment's need for water.

As an example of a water law giving general provisions to the environment, the PRC's National Water Law prioritizes the domestic needs of both urban and rural households but only calls for "overall consideration" for agricultural, industrial, ecological, and environmental needs for water and navigation. It expands this with a general statement of intent: "[f]ull consideration shall be given to the ecological environmental need for water in the development and utilization of water resources in the arid and semi-arid areas" (Government of PRC 1988).

One of the few water laws that notes the environment's right to adequate water is South

Africa's National Water Act. It includes an explicit right of the environment to water in the form of an "ecological reserve," which is to be determined for each river basin. The ecological reserve is given as high a priority as water for basic human needs.²⁰ Kenya adopted a similar approach in its 2002 Water Act.²¹

Viet Nam's 2006 National Water Resources Strategy referenced the need for ecological flows, which built on the general provisions for environmental protection stated in the Law on Water Resources (No. 08/1998/QH10). Further guidance is needed for its implementation, particularly in the hydropower sector, in which releases for environmental flows need to be balanced against the opportunity cost of electricity generation.

Some countries have introduced a simpler approach to maintaining downstream flows based on ensuring a minimum proportion of natural flows remain in rivers. The Philippines suggests a 10% minimum flow (NWRB Resolution No. 010901, September 2001), whereas the State Environment Protection Administration in the PRC suggests 20% in the case of running of river hydropower projects, unless case-specific reasons suggest that this can be reduced. Such a standardized approach is relatively arbitrary and is not linked to achieving defined objectives for a river system's ecosystem functions as adopted in other environmental flow methodologies.

The term "right to water" does not only refer to the rights of people but also to the needs of the environment with regard to river basins, lakes, aquifers, oceans, and ecosystems surrounding water courses (IUCN 2004, p. 27).

²⁰ South Africa's National Water Act, sec. 1(1)(b) defines the ecological component of the reserve as the quantity and quality of water required "to protect aquatic ecosystems in order to secure ecologically sustainable development and use of the relevant water resource."

²¹ Kenya's 2002 Water Act. <http://faolex.fao.org/docs/pdf/ken37553-a.pdf>

Box 5: Safeguarding Environmental Uses of Water

South Africa: The Ecological Reserve

South Africa's National Water Act called for a "reserve"—an amount of water supply that must be reserved from water resources to meet two important needs: (i) people's basic domestic needs, and (ii) "to protect aquatic ecosystems in order to secure ecologically sustainable development and use of the relevant water resource" (sec.1[1][b]). Following this law, each river system must be classified, and the amount for ecological reserve must be determined before any other water abstraction can be authorized. Although complex to implement because of capacity constraints and conflicts between users, the concept of the ecological reserve has focused considerable attention on the environment as a water user and the links between quality of the aquatic environment and the services it provides to communities. A number of environmental flows have been set and are being implemented and monitored. One approach being used to implement the law is the downstream response to imposed flow transformation methodology in the Palmiet and Breede rivers.^a

Viet Nam National Water Resources Strategy Recognizes Environmental Use

The concept of ecological flows was incorporated into the objectives of the National Water Resources Strategy promulgated through a prime minister's decision.^b The objective of an ecological flow is

[e]nsuring the provision of ecological flows for maintaining aquatic eco-system consistence with the plans approved by authorities, while focusing on the rivers with significant reservoirs and dams (sec.2.2[a][2]).

Ensuring minimum ecological flows in rivers was further emphasized in the section dealing with implementation measures.^c Current planning procedures, however, have not yet adapted to the new strategy, so hydropower projects continue to alter river flows dramatically in terms of water quantity, quality, and timing. In cases where a power station is located many

kilometers from the dam, or if the project involves diversion of water to another river basin, long stretches of the parent river can become dry, apart from any contribution of minor tributary streams. Introducing new procedures to reflect the strategy has now become a priority topic of discussion in Viet Nam.

Yellow River Law: Safeguarding the Second Largest River in the People's Republic of China

The Yellow River is characterized by a mix of problems: floods, poor water quality, acute water scarcity, high sediment load, and severe erosion. River basin management has faced many challenges because of gaps in legal, policy, and institutional frameworks.

The Yellow River Law, designed primarily to address the unique problems of the Yellow River, is envisioned to be the overarching law that would save the Yellow River from pollution and excessive water use. The law provides a legal framework to coordinate the provisions of four existing but sometimes conflicting laws: the National Water Law, the Water Pollution Prevention and Control Law, the Flood Control Law, and the Water and Soil Conservation Law.

The Yellow River Law is expected to (i) complement and coordinate current laws and provide implementation instructions where these are lacking; (ii) create modern river basin legislative procedures; (iii) establish a modern institutional framework that clarifies current administrative and institutional relationships; (iv) identify and clarify links between the different areas of administration and law relevant to the basin; (v) establish standards where they do not exist and monitor procedures to ensure implementation; (vi) provide for dispute settlement and for orderly, efficient, and equitable sharing of water; (vii) provide for stakeholder participation, transparency of administrative actions, and accountability of public officials to the public and higher levels of government; and (viii) apply the principles of sustainability, environmental protection, minimization of environmental harm, and protection of ecological integrity for land and water.

^a Downstream response to imposed flow transformation methodology. See IUCN (2003) at www.iucn.org/themes/wani/flow/p25.html

^b Prime Minister's Decision 81/2006/QĐ-TTg on 14 April 2006. National Water Resource Strategy, part 2, sec. 2.2(a)(2).

^c National Water Resource Strategy, part 3 1.1(d).

Part 2: Managing Water Allocation and Authorized Use

Country presentations and discussions during the four thematic workshops on water rights and water allocation highlighted the diversity of participating countries, ranging from conditions in the Lao People's Democratic Republic (where water shortages are relatively rare) to Indonesia and the Philippines (where there is strong competition for water in areas surrounding urban centers). Within countries, there is similar diversity, not only between rural and urban industrialized areas, but because of markedly different climatic and topographic conditions, as experienced in northern, central, and southern areas of Viet Nam. All countries are committed to reforms that introduce the principle of integrated water resources management and meet the MDG for access to improved water supply. Table 2 lists the status of water legislation in the seven participating countries.

INCORPORATING BASIC PRINCIPLES: BENEFICIAL USE, EQUITABLE DISTRIBUTION, AND NO SIGNIFICANT HARM

Beneficial use. Beneficial use of water has historically been a central principle for water allocation and is reflected in many of the region's water laws. In the Water Code of the Philippines, article 18 states, "[a]ll water permits granted

Beneficial use of water has to be consistent with the interests of the public.

shall be subject to conditions of beneficial use.”²² Similarly, in Viet Nam's Law on Water Resources, exploitation of a water source is defined as “activities aimed at bringing benefits from the water resource” (art.3[9]), and the obligations of water users include “to use water for the right uses, economically, safely, and efficiently” (art. 23[1][b]). In the 2002 National Water Law in the People's Republic of China (PRC), beneficial use is stressed,²³ and obligations of efficient use are required at all levels of government and by individual users. For example, the law states that “units and individuals shall have the obligations of economical use of water” (art. 8).²⁴

The interests of the wider public may also be safeguarded, as in the case of the state of South Dakota in the United States, where the definition of beneficial use has to be “consistent with the interests of the public.”²⁵ It further incorporates consideration of efficiency and introduces tests of reasonableness to ensure that other beneficial uses are not compromised unfairly.²⁶

Equitable distribution. The principle of equitable distribution can cover a range of scales of water distribution, from a macro level of transboundary water sharing²⁷ down to a micro level of providing

²² Article 20 of the Philippine Water Code amplifies this concept: “The measure and limit of appropriation of water shall be beneficial use. Beneficial use of water is the utilization of water in the right amount during the period that the water is needed for producing the benefits for which the water is appropriated.”

²³ Article 4 requires all factors to be considered in the development, utilization, economization, and protection of water resources, including an emphasis on “multi-purposes use and on achieving maximum benefits.”

²⁴ Articles 50 to 53 lay out conservation measures.

²⁵ “Beneficial use” is defined as “any use of water within or outside the state that is reasonable and useful and beneficial to the appropriator, and at the same time is consistent with the interests of the public of this state in the best utilization of water supplies” (South Dakota Code Title 46, secs.1–6[3]).

²⁶ “The right to water or to the use or flow of water in or from any natural stream or watercourse in this state is and shall be limited to such water as shall be reasonably required for the beneficial use to be served, and such right does not and shall not extend to the waste or unreasonable use or unreasonable method of diversion of water” (South Dakota Code Title 46, secs. 1–4).

²⁷ For example, article IV of the Helsinki Rules on the Uses of International Rivers (1966) of the International Law Association states that each basin state is entitled, within its territory, to a reasonable and equitable share in the beneficial uses of an international drainage basin. www.internationalwaterlaw.org/intldocs/helsinki_rules.html

Table 2: Primary Legislation in the Seven Participating Countries^a

Country	Legislation	Year Passed	Scope of the Law			Licensing
			Surface Water	Ground-water	Waste-water	
Indonesia	Water Resources Law (Law No. 7/2004)	2004	√	√		Provides enabling licensing framework for surface water and groundwater
Japan	The River Law Amendment to the River Law	1964 1997	√			Permission for river water use is required and is given by river administrators.
Lao People's Democratic Republic	Water and Water Resources Law (No.126/PDR)	1996	√	√	√	Permission for water use is required, but no licensing system.
Philippines	Philippine Water Code (Presidential Decree No. 1067)	1976	√	√	√	Licensing for surface water and groundwater; for wastewater, the law refers to other regulatory systems.
Sri Lanka	(No dedicated water law, but range of related laws; Water Act drafted, but consideration by legislature delayed because of political circumstances)		No specific water resources law			
Thailand	(No dedicated water law, but range of related laws; draft Water Resources Act prepared for consideration by Parliament)	2005 (draft)	No specific water resources law			
Viet Nam	Law on Water Resources (No. 08/1998/QH10)	1998	√	√	√	Licensing for surface water and groundwater; for wastewater, the law refers to implementation by other state agencies enabled through other legislation.

^a A number of the national water laws can be accessed through the ECOLEx environmental law database at www.ecolex.org/index.php

water supplies to communities.²⁸ The question of equitable distribution within a basin context raises many economic and social dimensions. In practice, however, the discussion of equity has

tended to focus on only a very small part of water resources—that needed for drinking water supply and domestic purposes. Secure access to water to support life and livelihoods, however, is central to

²⁸ For example, equitable access to water was a significant component of the governance theme at the 2001 International Conference on Freshwater in Bonn. www.water-2001.de/outcome/BonnRecommendations/Bonn_Recommendations.pdf

poverty reduction, and as Bruns (2004) pointed out, the “lack of secure and enforceable rights poses a much bigger problem for those who are poor.” He noted that water rights can help the poor

- safeguard access to basic needs,
- sustain livelihoods,
- participate in governance,
- prevent and resolve conflicts, and
- invest in improving their lives.

Such rights may also be linked to greater certainty in land tenure; for example, the marked increase in productivity of irrigated agricultural production in Viet Nam once land rights were granted during the *doi moi*, or renovation period, in the late 1980s.

So, which strategies will be used to facilitate the equitable distribution of water for production as well as the relatively small amounts needed to meet basic domestic needs? These strategies will be fundamental in reducing poverty, particularly in rural and periurban contexts. As urban centers expand and land use changes, how will planning and decision-making processes affect existing authorized water use? Such strategies will need to address some of the critical interfaces in water use including urban versus rural, industrial versus agricultural, and environment versus development. For instance, to what extent do former agricultural users receive any benefits from transfer of water use to urban and industrial consumers? Are their existing uses protected?

From a comparative analysis of water laws in southern African countries, Bird (2004) noted that “beyond an allocation for primary uses, little guidance is given [in the legislation] on how the term equitable will be applied for allocating to other users or deciding on permit applications.” The exception perhaps is South Africa’s National Water Resource Strategy that prioritizes poverty reduction initiatives.²⁹

In South Africa’s National Water Act, the introduction to chapter 4 on the use of water explains that the act “[was] founded on the principle that National Government has overall responsibility for and authority over water resource management, including the equitable allocation and beneficial use of water in the public interest.”

The equity dimension also involves aspects of intergenerational equity, i.e., how to make provision for future generations in planning and through adaptive management; gender equity, which is of particular importance given the prominence of women in water-related tasks; and equity among regions within a country, which is often a sensitive political issue.

No significant harm. The third guiding principle of “no significant harm” is relevant to local and national levels. The Water Code of the Philippines, for example, requires consideration be given to “protests filed” and “possible adverse effects” when reviewing a new permit application. In terms of the actual use of a water right, the code states that it “shall be exercised in such a manner that rights of third persons or of other appropriators are not prejudiced thereby” (arts. 16 and 24).

Raising awareness about the problems caused by a lack of integration in planning decisions between administrative units within a river basin needs to embody the principles of equitable distribution and no significant harm in some form, and this may take many years. The case of the Komadugu–Yobe Basin in Nigeria demonstrates that cooperative arrangements can be reached between upstream and downstream states even in the absence of an effective legal framework (Box 6).

Water rights shall be exercised in such a manner that rights of third persons or of other appropriators are not prejudiced thereby.

²⁹ In the case of South Africa, the National Water Resource Strategy requires that “water for social needs such as poverty eradication, primary domestic needs, and uses which would contribute to maintaining social stability are given priority over water for key economic sectors and employment creation.” www.dwaf.gov.za/Documents/Policies/NWRS/Default.htm

Box 6: Nigeria—Addressing the Adverse Impacts of Inequitable Abstraction in the Hadejia–Jam’are–Komadugu–Yobe Basin

The Komadugu–Yobe is a network of rivers and wetlands in northern Nigeria on the border with Chad. The inhabitants of this arid zone make their living in recession agriculture, pastoralism, forest use, fishing, and tourism. The fast-growing population and its economic activities, however, demand a large share of water resources—estimated to be more than twice the available water. Upstream irrigation and urban water supply are the major users. The Komadugu tributary no longer reaches the Yobe River; it is blocked by silt and weeds. Water resources management in the basin is fragmented, with ill-defined and often conflicting responsibilities between government agencies and stakeholders.

In 1999, the six constituent states in the basin agreed on a charter and memorandum of understanding that embodies the principles of integrated water resource management. A catchment management plan appended to the memorandum of understanding, signed by the six governors and the Federal Ministry of Agriculture and Water Resources, recognized the needs of downstream users as well as upstream users, and acted as the main vehicle to redress past inequities and to reduce the downstream impacts of overabstraction. The first initiative of this type in Nigeria, the memorandum of understanding and charter are now influencing consultations on revision of Nigeria’s national water law.

Source: IUCN, www.iucn.org/en/news/archive/2006/06/19_nigeria.htm

As with all statements of principle, the key question is how they can be translated into practice. The first step could be to transform the generic formulations into specific guidance relevant to the local context; this guidance could take the form of a national water resources management strategy. The strategy would provide more detail on water-use priorities and would reflect policy on associated aspects, including food security, spatial planning, industrial development, and environmental values. Specific criteria could then be established to assist in making decisions in areas where water is scarce and competition is high among various types of users.

MOVING TOWARD WATER LICENSING

The implicit and explicit approaches to water allocation referenced in part 1 and explained in Box 7 broadly characterize the type of administrative and regulatory systems found in Asia. Table 3 summarizes the current situation of water allocation used by countries participating in the NARBO workshops. Japan and the Philippines adopted explicit licensing more than 30 years ago, Viet Nam approved implementing regulations for licensing in 2004, and Indonesia is currently developing such regulations. The Lao People’s Democratic Republic and Thailand tend to follow more of an implicit approach.

Table 3: Basic Water Rights, Water-Use Rights, and Allocation Systems in National Legal Frameworks

Country	Are Basic Water Rights Legislated?	Approach to Allocation of Water-Use Rights		Recognizes Customary Rights	Water-Use Rights Regulations Exist
		Implicit Approach (e.g., Project-Based)	Explicit Approach (e.g., Licensing System)		
Indonesia	No, but state “guarantees” a minimum daily amount and gives priority to daily human needs and small-scale irrigation.	Allocations currently determined in master planning and periodic administrative review processes.	Licensing is being introduced under Indonesia’s Water Resources Law, which is not yet operational.	Yes, provided customary rights are “not contradictory to national interests and legislative regulations” (Water Resources Law, art. 6[2]).	In draft
Japan	Not in the River Law; the Waterworks Law stipulates that utilities should supply to all residents.	NA	Licensing system is based on first in time, first in right.	Customary use is taken to mean traditional users—mainly irrigation—who have permanent priority rights over subsequent users.	Yes
Lao People’s Democratic Republic	No, but small-scale uses (Water and Water Resources Law, art. 15) are exempt from approval, including family use, fishing, and family-based agroforestry and livestock.	Based on water-use plans: small, medium and large uses defined (arts. 15–17).	No water licensing system, but approval is required for medium-scale project development (by the agency) and large-scale (by the government).	Not explicitly recognized in water law.	NA
Philippines	No, but legislated priority is given to hand-carried water, bathing, washing, and watering of animals, all of which are also exempt from permit.	NA	Licensing system estimates are that only 35% of current water use is licensed, based on first in time, first in right.	Not explicitly recognized in Water Code of the Philippines; see note on Indigenous Peoples Rights Act of 1997.	Rules and regulations under the Water Code
Sri Lanka	No	Project-based allocations for irrigation, bulk water supply, and hydropower; seasonal planning meetings for irrigation given legal effect	None	Not in water-related legislation, but traditional rights are recognized in practice.	NA
Thailand	None under existing legal framework, but three categories in Water Resources Act imply a priority (art. 10): living and household-related uses, commercial agriculture, industry, hydropower, and larger or interbasin use.	Project-based allocations for irrigation, bulk water supply, and hydropower	None	None	Not yet
Viet Nam	No, but article 1 of the Law on Water Resources includes state commitment to ensuring water for people’s lives.	Allocations based on design of development projects and modified as required by local context.	Framework for licensing in Water Resources Law and subsidiary Decree (No. 149/2004/ND-CP) is yet to be fully implemented.	Not explicitly recognized in water law.	Yes

NA = not applicable.

Box 7: Implicit and Explicit Approaches to Water Licensing

Throughout Asia, water allocation for specific development projects is common—the determination of an irrigation duty for an irrigation project, the allocation of bulk water supply from a reservoir or river for urban use, or the diversion of water for hydropower generation through a concession agreement. How these water allocations are granted—through a top-down, implicit approach or a more structured and enforceable explicit system—may determine just how secure or guaranteed the allocations are and whether they will withstand times of water stress.

Implicit Allocation: A Planning System

In an implicit approach to allocating water, the actual allocation is often determined during a top-down planning process.

The formality and transparency of such allocations vary considerably. In some cases, allocation may be granted in a statement in a master plan or feasibility study, with no subsequent regulatory agreement to uphold its implementation. In other cases, the precise details and conditions of the water abstraction or allocation may be set out in a concession agreement.

A main issue with the implicit approach is the security of the allocation. When competition for water intensifies, including when the environment naturally demands more water to offset threats to the ecosystem, are those allocations secure? They may be officially stated in project documents and agreements, but are they further secured through regulatory agreements? Lack of protection to water allocation may inhibit investment.

Explicit Allocation: A Licensing System

More explicit systems are introduced to address competition for water.

The explicit approach uses a licensing system—a significant shift from the top-down implicit approach to a more responsive approach.

In an explicit system, applications from potential water users are considered within a framework of priorities set by the government, preferably established through a consultative process. These priorities and the procedures to implement them are set out in primary and subsidiary legislation and may be further articulated in basin strategies formulated to reflect the local context.

Not all water uses require a license. Primary legislation may identify permissible uses for which no license is necessary (e.g., household use or subsistence agriculture) and also make provision for temporary or permanent exclusions or “general authorizations” for specific categories of uses or areas (see part 3 on transition arrangements).

Transparency, consultation, and accountability are key elements. Flexibility is also needed to enable water use to adapt to future changes in priorities.

There may be little need to move away from an implicit system in some countries. In water-abundant situations, the implicit approach may be effective and avoids the administrative burden of a licensing system. “Don’t fix what isn’t broken” was a key message emerging from the NARBO workshops. Drawbacks of implicit systems, however, include concerns over security of water use, a lack of transparency in the decision-making process (particularly in relation to how water-use priorities are set), and a lack of accountability for delivery of the allocated water.

As competing pressures on a water resource intensify, difficult choices need to be made, including the reallocation of water use over time as priorities change. Then, the general trend is toward adopting a more explicit regulatory approach and focusing on the river basin as the unit for considering water allocation. Box 8 illustrates the move toward a licensing system

in Japan based on a “one basin, one permitter” approach.

There are a number of factors that must be considered and accomplished to achieve successful implementation (and the desired results) of an explicit system. These include

- setting priorities among water uses, including safeguarding the interests of the poor;
- understanding available water resources and needs;
- procedural aspects of license applications, consultations, decision making, and appeal;
- the transition period and process, including license exemptions (see part 3);
- administrative capacity for implementation;
- procedures for water shortage and adaptive management to accommodate changes in priority; and
- data needs and analytic capability.

Box 8: Japan—"One Basin, One Permitter" Approach

After World War II, water demand in Japan increased significantly because of rapid industrialization, urbanization, and population increase, thus putting pressure on the existing system of water allocation. River systems had multiple permittees who authorized the use of river water independently and without integration, often leading to water shortages downstream.

Before 1964, the applicable law stipulated that each prefecture governor had the authority to issue permission for river water use, thus leading to the possibility of inconsistent water rights administration.

A central reform of the 1964 River Law was the "one basin, one permitter" principle for water allocation. Permissions for river water use in a river basin are granted by one permitter or river administrator. Class A river

systems often cover more than one prefecture and, under the River Law, are now managed by the national government through the Minister of Land, Infrastructure and Transport. Class B river systems generally lay within a single prefecture and are managed by that prefecture in consultation with its municipalities.

The "one basin, one permitter" approach has been successful, leading to

- broader-based consideration of river water utilization;
- water-use rights within a basin established across administrative boundaries (downstream-upstream links); and
- improved coordination among multiple water users, especially during droughts.

Table 4 sets out some basic attributes of an explicit water-use rights system (World Wide Fund for Nature 2007), including the conditions that may be placed on the use and security of tenure.

In a briefing paper on water allocation and use, the Government of New Zealand reflected that water allocation depends on knowledge of the needs of the river system and the quantity of water available. Water allocation as a process

- should determine the amount of water needed in rivers, streams, and aquifers to sustain in-stream values; and
- grants legal authority to take, dam, or divert water bodies up to a specified amount, sometimes subject to conditions concerning the maintenance of minimum flows or water levels in the water body, and relative priority among permit holders when there is insufficient water for all to exercise their legal authority in full.³⁰

DEALING WITH WATER SHORTAGE: IMPLEMENTING PRIORITIES

Water shortage provides a critical test for any allocation system and its administration. Variability in climate and hydrology are natural phenomena. Annual fluctuations in dry season flows may be significant and need to be factored into decisions on the security of supply and the quantity of water available for allocation. In Japan, the water that can be allocated to a new user is based on the availability of water in the river in a "standard drought year" after existing uses and downstream needs have been determined.³¹ To accommodate extreme drought situations, licensing conditions generally make it clear that although an amount of water is specified for extraction from the source, this is not a guaranteed amount. Extreme conditions, such as drought or other natural disasters, inevitably impose constraints on water use.

³⁰ Water Programme of Action: Water Allocation and Use. www.mfe.govt.nz/publications/water/water-allocation-use-jun04/index.html (section 3).

³¹ The standard drought water discharge is used as the measure of availability of water in a river and is based on the minimum reliable flow measured over 355 days of the year—determined over the most recent 10-year period. The normal discharge is the amount that needs to remain in the river and comprises allocation to existing uses, including customary use (discharge for vested water rights) and discharge to maintain the normal functions of the river (discharge for maintenance) (Nakai 2005).

Table 4: Basic Attributes of a Water-Use Right

Attribute	Description
Quantity	The amount of water (volume) that the holder of the right may abstract or the amount of waste (volume/concentration or load) that the holder of the right may discharge.
Quality	The quality of the water to be abstracted or disposed.
Source	The specific resource and location from which the right is awarded.
Timing	Restrictions on the time that the right applies, i.e., times that the volume may be abstracted or time that the waste may be discharged.
Conditionality	The conditions of use, particularly in terms of quantity and quality. Some rights are absolute—guarantee of a certain quantity and quality, while other rights have variable assurance of supply and quality depending on the available resource. Other conditions can include any “hands-off” flow requirements to protect minimum environmental flows.
Use	The specific use for which the water is abstracted (e.g., irrigation, mining, etc.) or the specific origin of the waste (e.g., canning factory, mine process).
Duration and Ownership	The duration for which the holder is entitled to the rights conferred. Some rights are permanent while others expire after a period of time.
Transfer	Whether the right may be sold, transferred to another person or location, or inherited.
Security and Enforcement	Details of the administrative body with the legal mandate to award the right, including the extent of that mandate. Crucial aspects are whether the rights are guaranteed, what measures are taken if the rights cannot be fulfilled, and the compensation received if the rights cannot be fulfilled or if right is removed.

Source: World Wide Fund for Nature 2007.

The main question is how priorities are established and risks are shared in times of water shortage. Or, more specifically, which water uses will be restricted and which will be allowed to continue unaffected? Table 5 summarizes how countries participating in the NARBO workshops are addressing water shortages. In most cases, domestic and municipal water uses are accorded highest priority. In emergency situations in the Philippines, those uses override the normal “first in time, first in right” principle. A water crisis management committee is also established to monitor and oversee implementation. Under Thailand’s proposed water legislation, more detail is provided on the setting of priorities in the dry

season. Water supply for cities and communities, including domestic use and industry, is given the highest priority ahead of “high-value” agriculture and salinity control. Within agricultural water use, priorities are further distinguished. In decreasing levels of importance, the priorities are marine animals and fishponds; vegetable and fruit gardens; field crops; and dry season paddy rice, which has high water demands. In addition to domestic concerns, the priority accorded to meeting international obligations can also be a major issue. South Africa’s National Water Act specifically requires that such obligations be considered priorities (sec. 2[i]).

Developing a comprehensive drought strategy that is consistent with a water rights system is a major challenge. How the priorities are operationalized within a particular basin is an essential procedural question. The United Kingdom, which is considered a wet country, has experienced frequent water shortages over the past

Developing a comprehensive drought strategy that is consistent with the water rights system is a major challenge.

few years, leading to restrictions on water use, particularly in the southeast. When this happens, the first usages to be restricted by the water utility are domestic hosepipes and sprinklers for gardens. If projections indicate that a utility still cannot supply its commitments, it may apply to the environment agency for a drought order under which other water uses would be prohibited.³² In Australia, cities are adopting gradually increasing levels of restrictions on residential water use to cope with prolonged drought conditions. Brisbane, for example, has been operating under level 5

restrictions since April 2007 (the highest level of restrictions at that time); the Queensland Water Commission organized a public consultation before introducing more extreme level 6 restrictions in certain council areas.³³

Regulatory frameworks usually do not provide for compensation to water users for losses because of the effects of extreme climatic conditions. This would generally fall under government programs for drought relief, including crop insurance.

Water users should be informed of the constraints that may be placed on their water

Table 5: Priorities during Water Shortage

Country	Priorities in Times of Shortage	Notes
Indonesia	<ul style="list-style-type: none"> Domestic use Agriculture in existing small-scale irrigation systems 	<ul style="list-style-type: none"> Priorities for other uses are decided by the authorized level of government.
Japan	<ul style="list-style-type: none"> Rights established first in time 	<ul style="list-style-type: none"> Subject to constraints based on outcome of dialogue through drought conciliation councils and ultimate decision-making powers of river administrators (Box 9)
Lao People's Democratic Republic	<ul style="list-style-type: none"> Drinking and domestic uses Hydropower Agriculture 	<ul style="list-style-type: none"> Not considered a major issue because the levels of water stress are not generally significant.
Philippines	<ul style="list-style-type: none"> In emergency situations—domestic and municipal purposes; otherwise, rights established first in time 	<ul style="list-style-type: none"> Water crisis monitoring committee is established.
Sri Lanka	<ul style="list-style-type: none"> No predetermined priorities; in the Mahaweli system, a panel of water users is established and, in other areas, a district government agent sets up consultations 	<ul style="list-style-type: none"> May invoke the Disaster Management Act, 2005
Thailand	<ul style="list-style-type: none"> Water supply in cities and communities, including domestic and industry Agriculture using limited water Salinity control Second rice crop Water transport and sailing boats 	<ul style="list-style-type: none"> Based on draft Water Resources Act
Viet Nam	<ul style="list-style-type: none"> Water for daily life Water for cattle and poultry rearing and aquatic and marine product culture Important industrial establishments and research institutions Food security and crops of high economic value Other water exploitation and use purposes 	

³² In May 2006, the Sutton and East Surrey Water Company was allowed a drought order by the Environment Agency under the 1991 Drought Direction. In addition to the domestic hosepipe and sprinkler ban, the drought order empowered the utility to restrict watering of parks and recreational areas, e.g., golf courses; filling of swimming pools and ornamental ponds; vehicle-washing equipment; the washing of roads, vehicles, trains, and aircraft, except for purposes of hygiene; the cleaning of buildings and industrial premises; and automatic flushing toilets when buildings are not in use. The drought order did not restrict commercial agriculture or industrial use for which license conditions set out procedures for dealing with periods of shortage.

³³ See www.qwc.qld.gov.au/Water+restrictions

use during drought situations and the process to be followed in imposing usage restrictions. Temporary reallocation to a higher priority use during times of shortage inevitably raises the question of compensation. For example, the restrictions imposed on irrigation use for farmers from the Angat Reservoir in the Philippines

during 1990s drought have been a contentious issue.

Introducing a water trading or banking system for drought situations may soften financial implications by transferring resources from low- to high-value water use. It could also transfer any burden of drought relief from the government

Box 9: Addressing Water Scarcity

The People's Republic of China: Water Contract "Transfers" from Dongyang City to Yiwu City

In the absence of a legal framework for water transfers, a system using water contracts has been agreed upon between Dongyang City and water-scarce Yiwu City, both in Zhejiang Province. While economic development saw Yiwu City grow from a population of 30,000 in the early 1980s to 500,000 today, Dongyang City has managed its water storage and even achieved water savings through efficient irrigation.

Rather than develop further storage within their own areas, both cities considered it more cost effective to agree on a water transfer arrangement that involved building a transfer canal. Dongyang City now provides 50 million cubic meters per year for urban water supply to Yiwu City, which pays \$24 million for the transported water supply. Almost 60% of this water is derived from savings because of irrigation efficiencies in Dongyang City. The arrangement has elements of both social and economic efficiency and effectively constitutes a transfer of water rights.

Source: Liu 2005.

Japan's Drought Conciliation Councils: A Case of Stakeholder Participation

Japan's drought conciliation councils serve as forums for mutual consultations among river water users in times of drought. They consider the various measures that a drought may require, including restrictions on water intake. The councils are generally composed of the river administrator, water users, local government, and the administrative agencies concerned. As of the end of June 1996, a total of 86 councils were established for class A river areas. By law, voluntary approaches are required as a first step with water users seeking conciliation in the "spirit of fair give-and-take." River administrators provide necessary information for the voluntary drought conciliation (art. 53, sec. 1) and can intervene if voluntary conciliation fails (art. 53, sec. 3). Regional characteristics are present in the style of drought conciliation because of the different historical backgrounds and traditions of each river.

The Tone River Basin includes Metro Tokyo, where unmitigated drought conditions would have catastrophic social and economic consequences. The Drought Countermeasure Coordination Council for Tone River System was established in 1974 after two severe droughts in 1972 and 1973. Twenty years later, in 1994, Japan faced unusually widespread drought conditions with 58 class A river systems, out of a total of 109, under drought conciliation negotiations. Conciliation negotiations started when the total water volume stored in all eight reservoirs in the upper reaches of the Tone River had fallen to 54% of normal. The Tone Council discussed and proposed the water saving activities, including water intake restrictions, and water users cooperated and voluntarily followed the council's proposals.

Source: The Infrastructure Development Institute, Japan (1997), *Drought Conciliation and Water Rights—Japanese Experience*.

California's Water Banking—Can It Be Applied Elsewhere?

California established a drought water bank to mitigate the effects of the 1987–1992 drought and to encourage water transfers from agriculture in the north to higher-value urban, municipal, and agricultural users in the south. Differential sale and purchase prices were set to cover transaction costs and encourage a surplus of sellers over buyers so that the balance could be used for allocation to the environment and groundwater recharge (prices were set at \$125 for a user to sell an acre-foot of water compared to \$175 to purchase the same amount). In 1991, more than 300 transactions were recorded, representing the sale by users of 1,000 million cubic meters and the purchase of 480 million cubic meters.

Many emerging economies may not permit such trading nor have the necessary administrative and technical systems in place. There is, however, potential for the principles of cross-subsidization to be incorporated into context-specific agreements among water users if there is a mechanism for coordinating and facilitating the dialogue.

Source: World Wide Fund for Nature 2007.

to those who receive the benefit as high-priority users (Box 9). Conceptually, this offers a possible solution, but it requires an advanced administrative system and raises concerns over measures to protect the interests of the poor. For these reasons, formal trading is not currently considered feasible in many Asian countries. This situation may change, however, over the next 10 years. In the PRC, for example, recent regulations stipulate that any water that can be saved by adopting conservation practices can be traded, subject to approval of the authorities.³⁴ Informal trading between users takes place and can be widespread in some countries, including Pakistan, where water allocations are often transferred on a temporary basis and groundwater sold from farmer to farmer.³⁵

ADAPTING TO CHANGE: FLEXIBILITY OF ALLOCATION SYSTEMS

Future changes in development circumstances and priorities—as well as the needs of future generations and uncertainty related to climate change—require an allocation system that has a degree of built-in flexibility. Box 10 outlines some of the pressures facing future development in the Citarum Basin around Jakarta.

Adaptive management is important, but at the same time raises uncertainty on the security of water use. Burchi and D’Andrea (2003) noted that water licenses or permits do not cast a water use right “in concrete.” Change of use or modification of an existing permit may be required for a number of reasons, including

- a new national, regional, or basin master plan;
- applications for alternative higher-priority uses;
- droughts or other emergencies;
- changes in available water resources because of the effects of climate change;
- a change in circumstances of the permit holder; and
- violation of terms of a permit.

The degree of uncertainty over the future pattern of water use and demand will influence the choice of the license period and frequency of any intermittent review periods. A too-short license period transfers the risk to the license holder, which may, in turn, limit their preparedness or willingness to invest in new technology that will produce efficiency gains and expand production. It undermines the security of their water-use rights. A license period that is too long, on the other hand, constrains a government’s capability to respond to changing circumstances. Attaining a balance of risk between the water user and government is an important consideration in setting license durations and review periods. Table 6 summarizes the duration of license validity in a range of countries.

International agreements may place constraints on the scope for adaptive management of a resource, e.g., a transboundary agreement that specifies a division of river flows. Similarly, commercial agreements may have a longer validity period than normal water-use licenses, e.g., concession agreements that guarantee a certain discharge of water for hydropower generation. As competition for resources intensify, it is increasingly important to ensuring that commercial concessions are consistent with long-term development plans for a river basin.

Hydrological uncertainty as a result of climate change has become an urgent issue. This uncertainty affects the adaptability of water resource planning scenarios. The extent that

The Water Code of the Philippines recognizes the need for adaptability: “[p]reference in the use and development of waters shall consider current usages and be responsive to the changing needs of the country” (art 3[e]).

³⁴ Order of the State Council No. 460 of 21 February 2006, including Regulations on Water Abstraction Licensing and on the Levy of Water Charges, (art. 27) reported in Burchi, 2006b.

³⁵ For more details on the issues surrounding water trading and water banking, see the World Wide Fund for Nature (2007, chapter 3) and Burchi and D’Andrea (2003, p. 59).

Box 10: Licensing Systems in a Changing World

Indonesia: How will the New Water Resources Law Influence Water Allocation?

Once implementing regulations for water licensing have been approved, allocation of surface water in Indonesia will gradually shift away from the current implicit system, which is based on a combination of master planning and periodic negotiations.

Rapid industrialization and urbanization require a flexible system that can adjust to increasing water demands. With limited opportunity and increasing costs of new source development, other options (such as efficiency improvements and transfer from existing irrigation users) need to be examined. One such case, the Citarum Basin, supplies the capital, Jakarta, with most of its bulk water. In the absence of any formal water-use right, existing irrigators do not receive any benefit if water is reallocated to other users such as industry. Similarly, there is no incentive for them to save water in order to transfer it to other users as part of a benefit-sharing arrangement.

How the licensing regulations will deal with these issues will demonstrate in practice how the basic principle of equitable distribution is interpreted and how smoothly reallocation can be implemented.

South Africa: Long License Periods with Built-In Review Periods

Water licenses in South Africa run for a maximum of 40 years and may be renewed on a rolling basis every 5 years. This is a relatively long period compared with those in Asia and was introduced in negotiations on the

draft water bill in order to provide security of tenure and confidence for investment in large agricultural estates. Periodic review of the license, however, provides the opportunity for the licensing authority to amend certain conditions, including the quantity of water, but not the license period. Such a review may take place to prevent deterioration of water quality of the resource, in cases where there is insufficient water or if required by changes in socioeconomic conditions (National Water Act, sec. 49[2]). Any amendment to the license conditions can take place only if other licenses on the same resource are amended in an equitable manner. If the change compromises the economic viability of the undertaking, compensation payments may be due.

The People's Republic of China: Incentives to Save Water

New regulations on water licensing issued by the country's state council in February 2006 provide an incentive for existing users to save water. In general, water trading is not allowed under the law, and an approval for a water license requires that the water be used for that stated purpose. Licenses are normally issued for a relatively short duration of 5–10 years, which makes it easier for the government to alter allocations if priorities change but provides little security to the user. A recent innovation of the regulations, however, allows a license holder to trade any water that has been saved through an "application of efficient practices" to a third party, thereby encouraging a win-win approach to water reallocation.^a

^a Article 26, Order of the State Council No. 460 of 21 February 2006, Carrying Regulations on Water Abstraction Licensing and on Levying Water Resources Charges.

Table 6: Wide Range of License Periods

Country	Licensing Periods
Japan	Generally 10 years ^a Hydropower: 30 years
Philippines	No time limit; provisions for modification (see Box 3: Philippines—an Explicit Approach)
South Africa	Maximum of 40 years, with 5-year rolling extension and periodic review
United Kingdom	Normally 12 years ^b
Viet Nam	Surface water: 20 years Groundwater: 15 years

^a There is a general understanding that license periods would be renewed unless special circumstances required a review of the terms.

^b See www.environment-agency.gov.uk/comdata/acrobat/guide_abstr_final_1142993.pdf. Licenses are not required for the following abstractions: (i) those for any purpose of fewer than 20 cubic meters per day; (ii) some land drainage operations; (iii) the filling of vessels (ships or boats), e.g., with drinking or ballast water; (iv) with consent exceeding 20 cubic meters per day to test for the presence, quantity, or quality of water in underground strata; (v) water used for fire fighting; (vi) certain emergency abstractions; and (vii) those abstractions operating under an exemption order or some other statutory exemption.

such variability requires additional flexibility in licensing systems is still unclear, and more research is needed on the likely impacts on water resources. To some extent, the resilience of the water resource system will depend on the extent

of storage developed.³⁶ One outcome may be the use of shorter license periods or provisions for intermediate review processes. Another may be the introduction of a predetermined and progressive scaling down of abstraction amounts sanctioned in licenses, which would be triggered by crossing a defined threshold of low flows. Again, caution is required not to apply unattractively short license periods that undermine the beneficial use of the water.

Providing compensation to water users for changes in the terms of a license prior to its expiration may be appropriate and needs to be considered in designing a licensing system. Box 10 summarizes the approach used in South Africa.

Increasing demands for water require a balance between demand-side conservation measures and supply-side solutions, e.g., the conservation incentives in regulation in the PRC (Box 10). The periodic review of license conditions provides an opportunity to introduce incentives for efficiency measures. This is, however, more difficult in systems based on the “first in time, first in right” principle, such as in Japan and the Philippines, where customary users (including established irrigation systems) are effectively exempt from any regulatory pressure to become more efficient. The only solution for accommodating new users is then on the supply-side, such as developing more storage, which may cost more both from a financial and environmental perspective.

³⁶ For example, see Rydgren et al. (2006).

Part 3: Building Effective Institutions— A Long-Term Commitment

MANAGING THE TRANSITION TOWARD LICENSING

Licensing systems require considerable technical knowledge—on hydrology of the water resource, the level of existing use, and the potential impacts of additional abstraction. Implementing licensing regimes also requires considerable administrative capacity, including staffing at local and national levels.³⁷ Above all, transparent procedures and criteria need to be in place for making decisions on individual license applications and trade-offs between competing uses. These procedures may take 10–20 years or longer to implement fully. In the intervening period, priorities need to be set and existing water use assured a legal status.

This part of the report looks at a range of approaches adopted to manage the transition period to a licensing system.

Transparent procedures and criteria on individual license applications and trade-offs between competing uses may take a long time to fully implement. There are approaches to manage the transition period to a licensing system.

Permissible use not requiring a license.

Providing clarity in primary and secondary legislation on uses that do not require a license is important. Thresholds for water use that does not need a license should reflect the scarcity of the water resource and implications for administering

the system. The Water Code of the Philippines exempts “hand-carried water, bathing, washing and watering of animals” from permit requirement (art. 14). Viet Nam’s Law on Water Resources includes small-scale agriculture as one of a range of nonlicensed permissible uses (art. 24[2]):

- small-scale surface water and underground water for family use;
- small-scale surface water and underground water for families in agriculture, forestry production, aquaculture, small industry and handicraft production, hydropower generation, and other purposes;
- small-scale sources of sea water for family use in making salt and raising marine products; and
- rainwater, surface water, and surface sea water already assigned or leased according to prescriptions of law on land, the provisions of this law, and other prescriptions of law.

Schedule 1 of the South African National Water Act similarly provides a detailed list of uses that are exempt from licensing.³⁸

Registration of existing use. Existing legal uses of water are generally automatically incorporated as legitimate uses under new legislation but (i) may require a registration process, (ii) be subject to a requirement to formally apply for a license, and (iii) may in the future be progressively subjected to similar restrictions on use as those placed on new uses. Time frames for registering existing uses and issuing licenses need to be pragmatic

³⁷ In terms of administrative process, the following aspects related to applying for a licensing were described by Burchi and D’Andrea (2005) and need to be covered in subsidiary legislation, i.e., the rules and regulations: (i) filing of an application, (ii) recording of applications, (iii) review of applications, (iv) deciding on applications, (v) formatting of permits, (vi) recording of decisions and permits, and (vii) appealing from adverse conditions.

³⁸ Permissible uses listed in schedule 1 of the National Water Act include among others: (i) reasonable domestic use, (ii) small gardening not for commercial purposes, (iii) watering of animals within limits, (iv) storage and use of runoff from a roof, and (v) emergency use. See www.dwaf.gov.za/Documents/Legislature/nw_act/NWA.pdf

and reflect the available administrative capacity. The use of general authorizations described as follows can reduce this administrative burden in a phased manner. The Water Code of the Philippines includes a 2-year period for registering water use (sec. 27 of 2006 Implementing Rules and Regulations), although this has not been effective in practice. South Africa's National Water Act embodies existing use as legitimate, provided that such use fulfills certain conditions, including being a legitimate use under preexisting legislation and is consistent with uses under the act (secs. 32–35). A licensing authority may require existing uses to be registered and may further require the user to apply for a license under the act.

General authorizations. Such authorizations, once officially notified, allow a defined water use to take place without need for a license. General authorizations may be temporary or permanent and cover a specific geographical area or the country as a whole (Box 11). This approach provides a flexible system for exempting less contentious water uses during the early stages of implementing a licensing system and instead concentrates licensing efforts on high-priority areas. As in South Africa, notification of a general authorization can take place through publication in the official gazette.

Similarly, South Australia's Natural Resources Management Act 2004 defines water allocation in terms of both the water that may be taken or held under the terms of a water license and the maximum amount of water that may be taken and used under a general authorization for use issued by the minister in respect to specific bodies (sec. 3[1]).³⁹

Priority areas. Progressive implementation or piloting a license system may be considered in particular areas under water stress and where there are major water users. This will allow the government or implementing agency to build experience in the challenges of implementation and administration. As capacity is developed, the scope of a licensing system can be expanded

(Box 12). Using general authorizations in parallel with progressive implementation of a licensing system offers a structured approach to the transition period.

Box 11: South Africa—Use of Temporary Authorizations to Reduce the Licensing Burden

Under the National Water Act, the responsible licensing authority may designate certain uses as exempt from license requirements for a specific period and within a particular geographic area (sec. 39). The use of water under a general authorization does not require a license until the authorization is revoked or expires. In this way, the licensing process can be targeted first toward the priority cases that have more of an impact on overall water use within a basin.

Box 12: Uganda—Identifying Priority Users for Licensing

In Uganda, because of the limited availability of administrative staff, implementation of the permitting system focused on users who have a significant impact on the water resource. Two hundred water abstractors and 200 polluters were identified, primarily supplying 60–70 major towns. Gradually, the permitting system will be extended into a comprehensive water rights administration system envisaged under the National Water Action Plan.

Source: World Wide Fund for Nature 2007.

Among the general pitfalls to avoid in introducing a licensing system are

- a lack of attention to managing the transition period,
- overoptimistic implementation schedules,
- attempts to license small uses that do not pose a threat to resource sustainability,
- unnecessary interference or disruption in customary rights systems,

³⁹ See www.austlii.edu.au/au/legis/sa/consol_act/nrma2004298/s3.html

- a lack of public acceptance resulting in theoretical “paper” rights,
- insufficient administrative capacity and resources,
- a lack of data on the carrying capacity of the water resource,
- ill-defined priorities of water use,
- a lack of clear procedural rules, and
- a lack of public awareness of the legal requirements.

IDENTIFYING THE GAPS: BUILDING CAPACITY

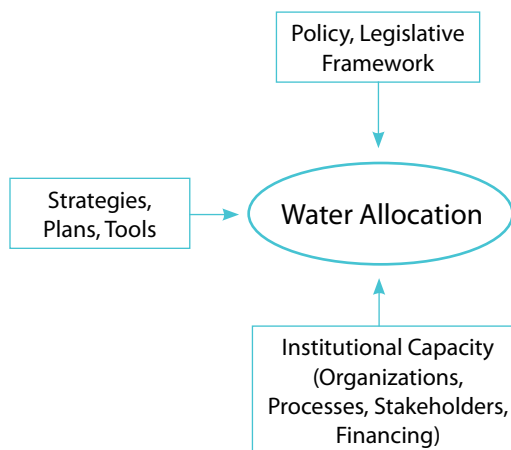
In cases where an implicit system of water allocation is to be retained, it is likely that improvements can be made and that past experience will point to areas for capacity building, whether related to improving security of tenure, increasing transparency and accountability, developing a better technical understanding for resource management, or introducing more effective means to adapt to changing circumstances.

This section focuses on the move toward a more explicit system of licensing water-use rights. Improvements may be required at three levels, as depicted in Figure 2. The level of policy and legislative framework includes primary laws and subsidiary regulations, decrees, and administrative orders necessary for

- implementation and specifying which water uses require a license;
- the priorities to be followed in allocation, including emphasis on basic needs and consideration of environmental needs;
- priorities in drought conditions; and
- procedures to ensure transparency consultation and accountability.

The second-level grouping of strategies, plans, and tools comprises the technical guidance needed to support decision making on license applications, such as hydrological databases, water balances, water-use profiles and registers of water use, basin plans, sector strategies, decision support tools, strategic environmental assessments, and risk assessments.

Figure 2: Capacity-Building Areas for Water Licensing



Source: World Wide Fund for Nature 2007.

The third level of institutional capacity covers the ability of organizations and stakeholders to give effect to the policy and strategies (World Wide Fund for Nature 2007).

A number of questions can be raised within each of the three elements of the capacity-building framework to help determine needs and support mechanisms (Table 7).

A prerequisite for a capacity-building plan is a clear strategy to manage the transition phase, which, as mentioned earlier, may extend over decades rather than years. For example, the Philippines introduced its permitting system more than 30 years ago, and yet only about 35% of water uses have licenses. Current initiatives to address the constraints were discussed in Box 3, and some of the challenges facing surface and groundwater management in the Lao People's Democratic Republic and Indonesia are outlined in Box 13.

Elements of a capacity building plan will need to cover

- development of subsidiary rules and procedures;
- awareness raising among water users and agency staff at all levels;
- analysis of the carrying capacity of surface and groundwater resources;
- license application and consultation procedures;

Table 7: Questions to Help Define a Capacity-Building Program

Policy/Legislation	<ul style="list-style-type: none"> • Are rights of access to water for basic human needs recognized? • Are customary rights protected, and how is this done? • Are priorities clearly articulated for normal and drought conditions? • How are environmental needs protected? • How are rights allocated to new users—is there flexibility to adapt? • How are collective water rights managed where there are a large number of small water users? • To what extent is the licensing system flexible to accommodate adaptive management? • What preconditions are necessary before some form of tradable water rights can be considered? • Are pollution control measures linked to the protection of water-use rights? • What methods are used to resolve conflicts between users?
Strategies/Plans/Tools	<ul style="list-style-type: none"> • Is there adequate technical understanding of existing water use and the basin water balance? • Is there a link among spatial planning, basin planning, and water allocation? • How are affected stakeholders involved in setting priorities for water allocation? • How are land, water, and environment strategies linked? • Does a drought strategy exist? Does a groundwater management strategy exist? Are they well-publicized? • Does water conservation or other demand-side measures feature in strategy development? • How are rights allocated to new users? • To what extent are the consequences of private sector concessions (e.g., hydropower) factored into the basin strategies and allocation plans? • What mechanisms are in place to encourage multiple purpose benefits from hydropower projects?
Institutional Capacity	<ul style="list-style-type: none"> • To what extent are interagency coordination arrangements effective for setting priorities among uses? For resolving conflicts? • Are the hydrological network and modeling tools sufficient to guide priority setting? • Does the technical understanding of basin water balance exist for determining consequences of alternative allocation scenarios and determining license applications? • What measures can be taken during the transition period to build the necessary capacity for water licensing, and does the legal framework allow such a phased approach? • Is technical capability in place to monitor and evaluate on an operational time frame? • What is the extent of the capacity to implement and enforce a water allocation system, and how can it be strengthened? • How are groundwater abstraction limits and zoning plans implemented? • How are illegal abstractions dealt with? • Is there sufficient administrative capacity (i.e., staff and financial resources)?

- cooperation strategies with other agencies for routing license applications, reviewing technical aspects, enforcement, and dealing with illegal abstractions;
- data collection and monitoring; and
- staffing and financial requirements.

ENCOURAGING CONSULTATION

Issuance of a water-use license takes place within a broader strategy setting in which the extent of

available water and the needs of downstream users, including the environment, are determined. Consultation processes may be required at each of these steps: (i) during policy and strategy development, (ii) on basin planning, (iii) in setting objectives for the quality of a river system, (iv) in determining in-stream flows, and (v) inviting comments on individual license applications. For example, rules and regulations⁴⁰ under the Philippine Water Code define the places where notice of a license application should be posted for a period of

⁴⁰ Implementing rules and regulations made under the Water Code, 11 June 1979.

Box 13: Challenges Facing Integration in Surface Water and Groundwater Management

Lao People's Democratic Republic: The Challenge of Planning Ahead of Contracts

Hydropower development will provide the Lao People's Democratic Republic with its major source of foreign exchange earnings and has been gaining momentum over the past few years. At least 20 hydropower concessions are at various stages of planning and implementation.

However, there is an absence of integrated river basin plans, and development has proceeded on a sector-by-sector basis. Hydropower projects can lead to major changes in the hydrological regime, particularly for peak load plants that respond to rapid changes in electricity demand and in cases where rivers are diverted to another basin.

A key issue in achieving a more integrated approach is the timing of the planning process. Concession and power purchase agreements for hydropower may be negotiated well before a basin plan is produced, which constrains water releases through prior commitments on power generation. By the time river basin management plans are established, there may be little flexibility to change such contractual agreements.

A current challenge for the country is to advance its basin planning processes so that conditions on water

resource availability can more effectively influence the operation of hydropower projects.

Indonesia: Coordinating Groundwater and Surface Water Licensing

Groundwater depletion in some Indonesian cities has reached a critical situation. In Bandung, a moratorium on new abstractions has been introduced in some areas of the city. One new hotel development is now trucking water from another less-affected area at significant cost.

Licensing for groundwater is the responsibility of city authorities, while licensing for surface water from interprovincial rivers, such as the Citarum River, comes under the central ministry. Developing links between the planning of surface water and groundwater will be important under the new institutional setup, not only because of the physical interaction between the two resources but also to develop consistent and complementary principles to govern their allocation. The new river basin councils and a river basin organization, Balai Besar, have an opportunity to play important roles in facilitating such cooperation.

60 days.⁴¹ The rules further note, “any person who may be adversely affected by the proposed appropriation may file a verified protest with the Council or with any deputized agency investigating the application” (sec. 8).

Although consultations on public policy, strategy formulation, and specific project proposals are becoming more widespread, there are concerns that such processes do not protect existing water rights, particularly customary rights.

Although consultations on public policy, strategy formulation, and specific project proposals are becoming more widespread, some concerns have been raised that such processes do not in themselves protect existing water rights, particularly customary rights. In a comment to the

United Nations Environment Programme's Dams and Development Forum in November 2006, the representative of the indigenous peoples groups reflected that

[i]n too many processes, the word “stakeholder” took away the importance of fundamental human rights of peoples and individuals to be part of the decision making process about their own futures ... peoples and communities had ownership and prior use rights to lands and waters to be used by a dam and that at times whether affected communities were consulted or not depended on the inclinations of governments or developers.

The issue here is accountability in the consultation process and the extent that those being consulted are fully aware of their water rights and

⁴¹ Notices should be sent to the barangay (village or neighborhood) chairman, municipal secretary, secretary of Sangguniang Panlalawigan (the legislative body of the province), Public Works Department of the district, or provincial irrigation engineer in addition to regional offices of relevant departments.

are engaging on a “level playing field” with those responsible for making the final decision.

Turning to the situation in the countries participating in the NARBO workshops, there is a general absence in their legislation for public consultation in the process of strategic planning or project developments. The earlier water laws of the Lao People’s Democratic Republic, Philippines, and Viet Nam do not contain specific provisions on consultation during the strategy development or planning processes, although in the recently approved National Water Resources Strategy in Viet Nam, a considerable portion of the implementation procedures deal with issues of public awareness, education, and participation.⁴² The requirement in the Lao People’s Democratic Republic’s water legislation for any large-scale river diversion to gain approval from the National Assembly should, in principle, place such major decisions more in the public domain.⁴³

In the more recently drafted law of Indonesia (2004) and the draft law of Thailand, the emphasis on participation is incorporated. In Indonesia, the law was drafted after a major shift to decentralize the government gave more control to districts and provinces. The composition of national and basin water resources councils is to be balanced evenly between government and nongovernment representatives. Notably though, the emphasis in development of water resources management plans is more on people being given the opportunity to object rather than proactive engagement in the formulation of the plan (art. 62[3]).

In Thailand, “participation of people at river basin level” is included in the preamble to the draft Water Law, and representatives of water users are included in the various governance arrangements at national and basin levels, e.g., in the National

Water Resources Committee (art. 14) and water-user associations (art. 42). The case of the Bang Pakong River Basin Committee demonstrates that the shift to a more participatory approach has been initiated even without full legal coverage (Box 14).

STRENGTHENING ACCOUNTABILITY

One of the main drivers behind an explicit system of water allocation is the security of water-use rights, particularly for less-influential water users whose voices tend to be unheard. Strengthening accountability in the decision-making process can be focused at a number of levels:

- translating government policy into development strategies, e.g., in realizing commitments on access to improved sources of drinking water;
- articulating those strategies into the setting of priorities in basin planning;
- ensuring that those priorities are used for water distribution plans and to guide decisions on license applications; and
- promoting compliance with license commitments.

In each of these processes, there is scope for greater transparency. Beyond that, opportunities are needed for representation by affected parties and appeal of decisions. Both are facilitated by the introduction of an independent oversight or appeals body, such as the Water Tribunal in South Africa (Box 15). The precise nature and composition of such oversight arrangements need to be adapted to suit the local political and social context.

⁴² Viet Nam National Water Resources Strategy—Towards the Year 2020, approved in 2006, part 3, section 2.

⁴³ Article 27 of Water and Water Resources Law, 1996. For small-scale diversions, approval of the provincial administration is required; for medium-scale diversion, approval of the national government is required.

Box 14: Thailand—A New Era of Consultative Management in the Bang Pakong River Basin

The Bang Pakong River Basin suffers from (i) deteriorating water ecosystems that directly affect people's livelihoods, (ii) a lack of water supply for domestic use, (iii) frequent floods, (iv) polluted waters, and (v) conflicts among water users.

A commission was established in 2001 (and then revised in 2003) to address these issues by (i) prioritizing and quantifying water use in the basin, (ii) undertaking measures for the equitable and efficient allocation of the waters of the basin, and (iii) negotiating conflicts and solving problems related to the implementation of water resources management. The commission has succeeded in getting the government sector, civil society, and communities to work together on a common project. It has been a painstaking process involving difficult changes in mindsets, behaviors, and trust levels,

and entailed trial-and-error efforts. Coordinators were identified within each subbasin to provide the bridge that allows the government and communities to design and implement appropriate solutions.

A promising achievement is the commission's preparations to undertake water allocation as specified in Thailand's draft Water Law. In recent years, the commission has gained some experience in terms of granting water-use permits to industries. Recently, the Bang Pakong Dialogue Initiative promoted consultations on water resources issues in the river basin at the grassroots level and reviewed how water allocation can be implemented. The agreed system for water allocation has now been fully initiated after it was piloted under the initiative.

Box 15: Introducing Redress Mechanisms and Incentives

South Africa: A Mechanism for Redress

South Africa's National Water Act provides extensive opportunities for people to express their views on strategy development, classification of river systems, determination of the ecological reserve, and individual applications for water licenses. However, beyond consultations, what mechanisms are there for redress if due process is not followed?

The National Water Act has established a water tribunal as an independent body empowered to investigate a range of decisions of the responsible authority and interpretation of the law, including the outcome of license applications, the content of a preliminary allocation schedules, and directives made by the authority. By June 2003, 5 years after the act became law, 31 cases had been brought before the tribunal: 13 dealt with licenses for stream flow reduction because of afforestation, 12 appealed directives dealing with contravention of license conditions, 4 related to license applications, 1 related to designation of an existing use, and 1 covered remedial measures for the prevention of pollution (Bird 2004). Although a major step in introducing accountability, two central aspects for allocation decisions lay outside the tribunal's jurisdiction: classification of water resources and determination of the reserve.

Philippines: Lessons from the Water Supply Sector and Incentive Mechanisms

Under Philippine law, water districts are government-owned and -controlled corporations duly organized pursuant to Presidential Decree No. 198. Water districts are tasked to provide water service within its area of franchise or jurisdiction. The Tagaytay City Water District is one of more than 500 water districts in the country. It serves the tourist spot of Tagaytay City in Cavite Province.

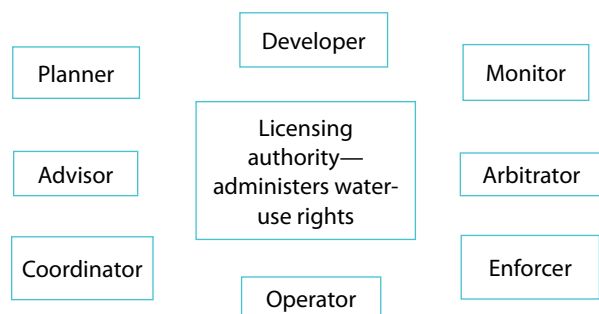
As of 2003, the district's collection efficiency was a high 97%. Its nonrevenue water improved dramatically from 60% in 1995 to the current 23%—better than the national average for water districts. This can be attributed to (i) clear legal mandate under Presidential Decree No. 198; (ii) high-quality customer service (including prompt response to complaints); (iii) an express water connection scheme of "apply now, get connected tomorrow;" (iv) performance incentive schemes for personnel; (v) adequate water system facilities; and (vi) keeping abreast of modern technology (including the use of computerized billing and geographic information system).

There are direct parallels between quality of service and the quality of administration. Key attributes are a strong political commitment, a clear legal framework, adequate resources, good technical information, transparency in implementing procedures, motivated staff, and openness toward consultations.

THE ROLE OF RIVER BASIN ORGANIZATIONS

RBOs take many forms, and their roles change over time as capacity for integrated management increases. Some, such as the Catchment Management Agencies in South Africa, will become water licensing authorities. Others, including the Murray Darling Basin Commission, are responsible for developing basin strategies and providing the overall framework within which licenses are issued by state agencies. The broad range of roles that an RBO could perform is depicted in Figure 3, which is modified from work done by Dourojeanni (2001).

Figure 3: What Role Does a River Basin Organization Play in Relation to Licensing?



These roles cover the following:

- **Planner.** Collates and analyzes water quantity and water quality data, undertakes strategic assessments, and oversees development of basin and strategic plans (e.g., RBOs in Indonesia and the Mahaweli Authority in Sri Lanka).
- **Advisor.** Provides policy-level advice and guidance to the agency responsible for granting water-use rights with information on availability of water resources in the river basin and merits of the application

(e.g., Perum Jasa Tirta 1 and Perum Jasa Tirta 2 in Indonesia provide technical recommendations as a basis for the issuance of water permits).

- **Coordinator.** Acts as a coordinating forum for water resources management among agencies and across sectors, promotes public participation, and raises awareness of water issues (e.g., the Bang Pakong River Basin Committee in Thailand facilitates coordination and agreement through stakeholder consultation and dialogue).
- **Licensing authority.** Administers the licensing system, including the receipt, evaluation, and determination of license decisions according to established implementing regulations (e.g., catchment management agencies in South Africa will, after the necessary period of institutional development, assume responsibility for water management in general and licensing in particular, which was a task previously carried out by the Department of Water Affairs [National Water Act, schedule 3]).
- **Developer.** Builds water storage and regulation infrastructure according to license authorizations (e.g., Mahaweli Authority).
- **Operator.** Operates and maintains water storage and regulation infrastructure according to license authorization (e.g., Perum Jasa Tirta 2, Mahaweli Authority).
- **Monitor.** Maintains or coordinates monitoring systems and networks for compliance with authorized uses, and investigates irregularities (e.g., Perum Jasa Tirta 2 in Indonesia and the Tennessee Valley Authority⁴⁴ in the United States, which has statutory authority to manage the entire multistate basin of the Tennessee River and its tributaries for flood control, power production, and navigation).

⁴⁴ See www.tva.gov/

- **Arbitrator.** Acts as an arbitrator in disputes between water users, and takes action to prevent disputes (e.g., Mahaweli Authority; in Europe, the International Commission for the Protection of the Danube River can provide assistance to resolve disputes between contracting parties and if not settled, arrange for arbitration procedures).⁴⁵
- **Enforcer.** Mandated to take necessary actions to enforce license conditions (e.g., Laguna Lake Development Authority in the Philippines has introduced a “multiuse” policy to ensure equitable use of Laguna Lake).

As experience and capacity are gained, some RBOs may increase their role in planning, advisory functions, monitoring, and arbitration. RBOs generally have not taken the role of licensing authority, but can as in the case of South Africa’s catchment management agencies. More generally, this is seen as a function of the national water apex body, line ministry, or local government, e.g., the National Water Regulatory Board in the Philippines for surface water and municipalities in Indonesia for groundwater.

RBOs generally have not taken the role of licensing authority.

⁴⁵ See Article 24 and Annex V of the Convention on Cooperation for the Protection and Sustainable Use of the Danube River. www.icpdr.org/icpdr-pages/home.htm

Part 4: Taking Action

As competition for water resources grows, there is a general trend toward more explicit systems of water allocation, meaning a trend toward licensing in national regulatory frameworks. A major challenge is ensuring that these frameworks provide the enabling environment for beneficial, equitable, efficient, and sustainable use of a country's water resources while actively promoting the interests of poor water users.

Each stakeholder group has a part to play in this process, and the range of entry points is indeed extensive—covering both the management of water resources and the delivery of water services. The following proposed action points are organized according to major stakeholder groups.⁴⁶

GOVERNMENT

- Ensure that the legal and regulatory framework clearly articulates priorities of water use consistent with national and development objectives, reflects customary uses where applicable, and provides for drought conditions.
- Go beyond statements of intent that define “access to water for basic needs” as a priority water use to incorporate a protected basic “right of access to water” in water policy and national water legislation.
- Establish institutional structures and procedures that promote independence, transparency, and accountability in the water allocation process.
- Provide the financial and human resources necessary for the phased transition to an explicit system of water allocation, recognizing that this will be a medium- to long-term process.

NATIONAL WATER APEX BODIES

- Raise awareness in government for the need for a comprehensive approach to water allocation that secures the needs of the poor and optimizes water use in line with national IWRM strategies.
- Develop policy for water allocation to be incorporated into law.
- Encourage coordination among national and provincial agencies to ensure effective integration of water management systems across sectors and administrative boundaries and for surface and groundwater.
- Promote a more strategic level of basin planning that sets a framework for public and private sector development, in particular by establishing a water resources management framework within which concessions for hydropower or bulk water supply may be negotiated.
- Consider innovative ways to encourage water conservation through the licensing system, such as allowing trading of water-efficiency gains (e.g., water saved by reducing leaks or using more efficient water-use technologies).
- In parallel with research activities, consider how adaptive management can be reflected in the licensing system to accommodate rapidly changing use while ensuring that existing water users retain a share of the benefits.
- Facilitate the discussion on how environmental functions of river systems can be protected, including adapting methodologies for determining environmental flows relevant to the local context.

⁴⁶ Capacity may also need strengthening in the technical aspects outside the scope of this report, including hydrological networks and databases, determining water balance, adapting methodologies for determining environmental flows, sector studies, and strategic environmental assessments.

- Address coordination in regulation of wastewater discharge and pollution control to avoid undermining water allocation decisions and to achieve a healthier population and environment.

REGULATORY (LICENSING) AGENCIES

- Plan for the transition toward explicit water licensing systems, and prioritize efforts to target high-impact water uses, incorporate use of exemptions, or general authorizations for less-critical water uses where appropriate.
- Raise awareness of the need for licensing among water users and the public in general.
- Identify opportunities to collaborate with other agencies for receipt, review, and processing of license applications, including decentralization.

RIVER BASIN ORGANIZATIONS

- Strengthen monitoring and analytic capability of river flows, water quality, and aquatic ecology.
- Enhance the technical and institutional capacity to advise the regulatory agency on determining license applications and water allocation decisions.
- Establish mechanisms for cross-agency and cross-sector coordination.
- Develop capacity for facilitating dispute resolution.

WATER SERVICE PROVIDERS

- Water utilities should develop explicit strategies and plans to deliver on commitments to (i) increase access to the basic water right for human needs, and (ii) secure performance contracts that include provisions for access to water services by households in poor communities.

- Irrigation service providers should work with water resources and regulatory agencies and RBOs to recognize and protect the customary water-use rights of farmers (either individually or collectively, with specific attention to ensuring the rights of poor farmers) during the transition toward more explicit systems of water licensing.

OTHER WATER AGENCIES

- Environmental agencies should work with water resources agencies and RBOs to enhance coordination of water quality monitoring and improvement and to develop appropriate procedures for determining a river's environmental needs for water.
- Spatial or regional planning agencies should develop closer links between regional planning and water resources planning processes.

NONGOVERNMENT AND COMMUNITY-BASED ORGANIZATIONS

- Raise awareness of the opportunities that a more explicit approach to water allocation, such as water licensing, can bring, including commitments to provide access to water for basic needs, the benefit of a more secure and defined water right (particularly in areas undergoing rapid economic and social change), and the raised profile of ecosystem functions and associated livelihoods.
- Participate in stakeholder forums and formal water management structures, such as RBOs.
- Raise awareness of use rights and develop information materials for use in communities.
- Work with water resources regulatory agencies, RBOs, and academe to monitor the introduction of more explicit systems of water licensing to document good governance and lessons learned.

ACADEME⁴⁷

- Undertake a comparative study of transitional measures for water licensing systems and building institutional capacity.
- Examine the implications of water licensing systems on customary uses and mechanisms to introduce necessary safeguards.
- Assess the approach to adaptive management to ensure flexibility of licensing systems to accommodate changing water-use priorities and long-term changes in supply resulting from climate change.
- Study alternative approaches to encourage benefit sharing among existing agricultural water users subjected to reallocation for urban or industrial use.

DEVELOPMENT AGENCIES

- Support reform programs and capacity building.
- Provide knowledge management products, and encourage information exchange regarding water rights and allocation, including case studies relevant to the region.
- Support regional networks of excellence, e.g., on water governance, including a regional knowledge hub on water governance.⁴⁸

- Support pilot activities to introduce licensing systems in a phased manner.

NETWORK OF ASIAN RIVER BASIN ORGANIZATIONS

- Continue sharing knowledge gained from experiences with implementing water rights systems, particularly on context-specific aspects of Asia.
- Consider facilitating twinning arrangements between RBOs at different stages of development to raise awareness of issues, share experiences, and develop capacity.
- Support a follow-up workshop after 2–3 years to reflect country achievements, challenges faced, and remaining issues to address.

ASIA–PACIFIC WATER FORUM

- Recognize and support a regional knowledge hub for water governance to undertake research, knowledge sharing, and capacity development in support of modern water legislation, including provisions for water rights and allocation.

⁴⁷ See also Bruns (2005), p. 302.

⁴⁸ The Asia–Pacific Water Forum’s Network of Regional Water Knowledge Hubs was launched in Singapore in October 2007 to improve knowledge networking on important topics in the water sector, including on water governance. Network formation was facilitated by ADB and the UNESCO-IHE Institute for Water Education. ADB also facilitated the formation of the Asia–Pacific Network of Schools and Institutes of Public Administration and Governance in 2004.

Appendixes

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Appendix 2: Summary of Country Legal Frameworks

INDONESIA		
Relevant water-related legislation, policy, and strategy	Water Resources Law No. 7/2004 Government Regulations on Water Resources Management and Water Use-Rights (in draft) Presidential Decree on Balai Besar (river basin organization)—supersedes Ministry of Public Works Decree 12/PRT/M/2006	
Basic Water Rights		
Legislated right to basic human needs	Not specifically legislated. State makes “efforts to guarantee” a minimum daily amount to fulfill a healthy, clean, and productive life. “Normal daily human needs” is the first priority, together with small-scale farming within existing irrigation systems (art. 8[1]).	
Customary rights	Yes, provided it is “not contradictory to national interests and legislative regulations” (art. 6[2]). Balai Besar will register the holder of customary rights under the draft Ministry Regulation on Use of Water Resources permit.	
Water-Use Rights (Allocation)		
Approach to allocating water-use rights	Administrative system based on master plans and annual water allocation plans. The 2004 Water Law differentiates between noncommercial water-use right and commercial water-use right.	
Priority for allocation	Normal daily human needs and small-scale irrigation for rice and <i>palawija</i> (crops grown in rotation with rice) only in the existing irrigation systems do not require permits (art. 8).	
Status of licensing systems (if applicable)	Groundwater licensing is operated by districts. Surface water permit system operated by some provinces under previous law and provincial regulation—not uniform. Regulation for water resources management under the Water Law is in preparation.	
Environmental provision	Not explicit in the Water Resources Law, but stated to be included in forthcoming regulations. The law has a general provision that the function of water resources management covers environmental aspects, among others (chapter III, Conservation of Water Resources, and other references).	
Water trading	Not permitted.	
Drought provisions	<ul style="list-style-type: none">• Priority under Water Resources Law accorded to normal daily human needs, together with the small-scale farming in existing irrigation systems. Priorities for other users are decided by the authorized level of government.• Meeting of provincial water resources committee that discusses drought plans—to be replaced with basin water resources committee in cross-provincial basins and nationally strategic basins.	
Organizational Setup (in relation to water rights)	National Water Resources Council; Basin Water Resources Council	(To be established) Policy and coordination
	Directorate General of Water Resources (under Ministry of Public Works)	Policy and strategy development. Oversight of river basin organizations for strategic and cross-provincial basins. Licensing of water rights in river basins that come under the responsibility of central government.

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Indonesia: continued

	<i>Balai or Balai Besars</i>	"In-stream" water management and technical recommendations for issuing license for river basins under central government responsibility; development of strategic basin plan for long, medium, and short term.
	Public corporations (Perum Jasa Tirta 1 and Perum Jasa Tirta 2)	Operators. Propose water allocation plans—situation may change once <i>Balai</i> becomes fully operational.
	Ministry of Environment and provincial, district services	Environmental planning, wastewater licensing, pollution control, environmental assessment.
	Ministry of Agriculture	Agriculture and plantation land use plan and management.
	Ministry of Forestry and provincial, district services	Catchment planning and management of forests.
	Provincial and district water resources services	Management of water resources under their jurisdiction (single province or single district; including licensing of surface water).
	District and city authorities	Licensing and supervising groundwater use.
	Provincial and district administrations	Issue of development licenses (urban, commercial, industrial).
Provisions for Participation/ Consultation	National, basin, provincial water resources committees with balanced nongovernment representation. Other details to be included in new regulations under preparation.	
Issues Raised Related to Water Rights and Allocation	<p>Institutional issues</p> <ul style="list-style-type: none"> • Coordination problems related to sharing roles and responsibilities at national and local level—holding up implementation of the Water Resources Law. • Implementing regulations not yet complete. • Separate organizational responsibility for surface and groundwater regulation and lack of coordination. • Lack of coordination between spatial planning and water resources planning processes. • Insufficient cost recovery from commercial users. Noncommercial users are subsidized, but budget allocations insufficient to cover cost. • Insufficient human resources. <p>Context-specific issues</p> <ul style="list-style-type: none"> • Lack of adequate hydrological data and water resources industry capacity. • Rapid urban development and industrialization in former agricultural areas—leads to conflict between commercial and noncommercial uses. • Users concerned that there is no guarantee from the government on delivery of agreed bulk supplies or compensation for any losses incurred. 	

JAPAN		
Relevant water-related legislation, policy, and strategy	1964 River Law (No. 167 of 1964) 1997 Amendment of River Law	
Basic Water Rights		
Legislated right to basic human needs	The River Law does not have provision on rights for basic human needs. The Waterworks Law stipulates that a water supply utility (usually run by local governments) cannot deny supplying drinking water for residents without any due reasons.	
Customary rights	Mainly relate to traditional irrigation use, which is considered as “first in right, first in time.”	
Water-Use Rights (Allocation)		
Approach to allocating water use rights	Permit system. Traditional users have permanent right. The term of water permit is usually 10 years, but is 30 years in the case of hydropower water use. For class A rivers, the Ministry of Land, Infrastructure and Transport issues permits. For class B rivers, the concerned local governments issue permits.	
Priority for allocation	Prior water uses usually have priority over newer water use (“first in time, first in rights”). However, this priority rule is often adjusted during drought, when water users consult with each other to decide how to allocate water (such as water intake restriction).	
Status of licensing systems (if applicable)	Introduced in 1964 under River Law. Fully functioning.	
Environmental provision	<ul style="list-style-type: none">• The aim of the River Law is to preserve the river environment as well as flood control and water utilization (art. 1).• The amount for maintaining normal river function is decided in every river system, considering the needs of transport, fishery, tourism, preservation of cleanliness of water, prevention of salt damage, prevention of occlusion of estuary, protection of river administration facility, maintenance of groundwater level, scenery, and the situation of inhabitation/habitats of animals and plants. The concept of “maintaining normal river function” incorporates aspects of an environmental flow.	
Water trading	No provision.	
Drought provisions	The River Law has some provisions for drought conciliation (arts. 53 and 53-2). In the case of severe drought, water users first consult with one another voluntarily for drought conciliation, and the river administrator may make necessary intervention or arbitration if no agreement is reached in the voluntary consultation. Drought conciliation councils have been established in some river basins to facilitate consultations among users.	
Organizational Setup (in relation to water rights)	Prime Minister	Before the National Sector Reform in 2001, the Prime Minister made the final decisions on comprehensive water resources development plan for seven river systems (Ara, Chikugo, Kiso, Tone, Toyogawa, Yodo, and Yoshino).
	Ministry of Land, Infrastructure and Transport	(i) Conducting river administration for class A river systems, including <ul style="list-style-type: none">• issuing permission for river water use; and• having responsibility to design, construct, and manage multipurpose reservoirs. (ii) Since 2001, developing and approving comprehensive water resources development plan for seven river systems (Ara, Chikugo, Kiso, Tone, Toyogawa, Yodo, and Yoshino).

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Japan: continued

	Ministry of Agriculture, Forestry and Fisheries	<p>(i) Conducting policy and administration of irrigation, including</p> <ul style="list-style-type: none"> responsibility to design, construct, and manage large-scale irrigation canal systems; and controlling land improvement districts. <p>(ii) Providing comments to the Ministry of Land, Infrastructure and Transport on water permit applications in class A river systems.</p>
	Ministry of Health, Labor and Welfare	<p>(i) Conducting policy and administration of drinking water supply (not in charge of construction and operation and maintenance of water supply facilities); and</p> <p>(ii) Providing comments to the Ministry of Land, Infrastructure and Transport on water permit applications in class A river systems.</p>
	Ministry of Economic, Trade and Industry	<p>(i) Conducting policy and administration of industrial water supply and hydropower generation (not in charge of construction and operation and maintenance of industrial water supply facilities or hydropower generation plant); and</p> <p>(ii) Providing comment to the Ministry of Land, Infrastructure and Transport on water permit applications in class A river systems.</p>
	Prefectures (primary local government)	<p>(i) Conducting river administration for class B river systems, including issuing permission for river water use;</p> <p>(ii) Supplying drinking water and industrial water as river water user;</p> <p>(iii) Providing comment to the Ministry of Land, Infrastructure and Transport on water permit applications in class A river systems; and</p> <p>(iv) Designing, constructing, and managing medium-scale irrigation canal systems (operation and maintenance of the canals are often turned over to concerned land improvement districts).</p>
	Municipalities, towns, villages (secondary local governments)	<p>(i) Supplying drinking water and industrial water as a river water user; and</p> <p>(ii) Designing, constructing, and managing medium- to small-scale irrigation canal systems (operation and maintenance of the canals are often turned over to concerned land improvement districts).</p>
	Japan Water Agency	<p>(i) Designing, constructing, and managing multipurpose reservoirs in seven river systems (Ara, Chikugo, Kiso, Tone, Toyogawa, Yodo, and Yoshino) under the supervision of Ministry of Land, Infrastructure and Transport; and</p> <p>(ii) Designing, constructing, and managing canal systems in the same seven river systems under the supervision of the Ministry of Land, Infrastructure and Transport; Ministry of Agriculture, Forestry and Fisheries; Ministry of Health, Labor and Welfare; or Ministry of Economic, Trade and Industry.</p>

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Japan: continued

	Land improvement district	A type of water-user association composed of irrigators; in charge of operation and maintenance of irrigation canals as a river water user.
	Electric power company	Designing, constructing, and managing reservoirs and other facilities for hydropower generation as a river water user.
Provisions for Participation/ Consultation	The drought conciliation councils are a typical example of a participatory process relating to the water rights system. They are composed of the river administrator, water users, local government, and administrative agencies concerned for each river and act as a forum for mutual consultation among the water users.	
Issues Raised Related to Water Rights and Allocation	<p>Institutional issues: not applicable</p> <p>Context-specific issues:</p> <ul style="list-style-type: none"> • There is a long-term trend of climate change in Japan, in which the annual average temperature has increased by approximately 1° Celsius over the last 100 years. Concerning precipitation, there have been numerous low rainfall years since 1970; precipitation was below average in 1973, 1978, 1984, 1994, and 1996, when water shortages led to losses. A trend of fluctuation between extremely low rainfall and extremely high rainfall has recently been observed—the trend of little precipitation in low rainfall years has been especially remarkable. Because of the decline in rainfall in recent years, securing a stable water supply throughout the country has been a key focus. 	

LAO PEOPLE’S DEMOCRATIC REPUBLIC		
Relevant water-related legislation, policy, and strategy	1996 Water and Water Resources Law (No. 126/PDR) 1999 Mandate of the Water Resources Coordination Committee, PM Decree No. 09/PM 2001 Decree on Implementation of the Water and Water Resources Law 2007 Establishment of the Water Resources and Environment Administration	
Basic Water Rights		
Legislated water rights	No legislated priority. Small-scale use (family domestic use and community requirement); cultural use and sport; fishing, fisheries, and other water life; soil, sand gravel, and aquatic needs situated in or nearby the water resource; basic agriculture, forestry, and livestock production needs of the family (art. 15).	
Customary rights	Not explicitly recognized in the Water Law. The Constitution (1991) recognizes the unity and equality of ethnic groups in the political process and protects their rights to preserve and improve their unique traditions and culture.	
Water-Use Rights (Allocation)		
Approach to allocating water-use rights	Administrative allocation on a project-by-project basis, e.g., hydropower concessions. Medium- and large-scale uses need to seek permission, (art. 18). Large-scale use approved by the government; medium-scale use approved by the concerned ministry (art. 19).	
Priority for allocation	No priorities specified except for drought (see “Drought provisions”). Use of groundwater must be reserved for drinking purposes (art. 13).	
Status of licensing systems (if applicable)	None	
Environmental provision	Preservation of the environment and scenic beauty (art. 22[iii]). Protect water resources from drying up (art. 29).	
Water trading	No	
Drought provisions	Not a major issue. Priorities are <ul style="list-style-type: none">• drinking and domestic uses,• hydropower, and• agriculture.	
Organizational Setup (in relation to water rights)	Water Resources Coordinating Committee	Interagency coordination and formulation of national policy.
	Water Resources and Environment Administration	Formed in 2007, combining the Water Resources Coordinating Committee Secretariat, Lao National Mekong Committee, and Environment Agency responsible for national water resources management and cross-sector coordination.
	Ministry of Agriculture and Fisheries	Responsible for water resources in agriculture.
	Ministry of Communications, Transport	Responsible for water resources related to communications, transport, urban water supply, and flood control.
	Ministry of Mines and Energy	Responsible for planning and implementing hydropower and mining operations, including negotiating concession agreements with private developers.
	Electricité du Laos	Responsible for developing and operating some government-owned hydropower projects.
	Lao Holding State Enterprise	State-owned enterprise as equity partner in private sector hydropower projects.

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Lao PDR: continued

	Ministry of Industry and Commerce	Responsible for industrial development planning.
	River basin committees	Plans to establish river basin committees, but no legal foundation. Draft decree has been prepared.
Provisions for Participation/ Consultation	No explicit provisions	
Issues Raised Related to Water Rights and Allocation	<p>Institutional issues</p> <ul style="list-style-type: none"> • Lack of clarity on authority for water rights allocation. • Lack of secondary legislation. • Fragmented management of water resources—lack of integration across sectors. <p>Context-specific issues</p> <ul style="list-style-type: none"> • No integrated basin planning. • Limited coordination between private sector hydropower developers in same basin or with mining operations. 	

PHILIPPINES		
Relevant water-related legislation, policy, and strategy	1976 Water Code (PD1067) 1991 Local Government Code RA 7160 Indigenous Peoples Rights Act RA 8371 Clean Water Act RA 9275 1983 Executive Order 927 (relating to the mandate of Laguna Lake Development Authority over Laguna Lake) Permit-implementing regulations are in para. K, sec. 4 of RA 4850	
Basic Water Rights		
Legislated right to basic human needs	No legislated right. Hand-carried water, bathing, washing, and watering of animals are exempt from permit requirement (art. 14, Water Code).	
Customary rights	Not explicitly related to customary use in the Water Code, but concept of existing water right is included (art. 22) and protection of third persons (art. 23) is incorporated. Existing uses had to be registered within 2 years of the Water Code to ensure that such rights continue. The Indigenous Peoples Act protects access to natural resources (sec. 7, paras. B and F, RA 8371).	
Water-Use Rights (Allocation)		
Approach to allocating water-use rights	Water rights recognized, and Water Code introduced a permitting system.	
Priority for allocation	Prior use has priority: “priority in time” (art. 22, Water Code). Where priority of time in an existing use is not clear, priority is accorded to domestic and municipal, irrigation, power generation, fisheries, livestock, industrial use, and others. Each basin has its own rules for allocation during drought.	
Status of licensing systems (if applicable)	Licensing system under the National Water Resources Board with detailed provisions in implementing rules. Estimates that only 35% of water users are subject to permit.	
Environmental provision	Policy requires a 10% minimum flow (Board Res. No. 01-0901, 24 September 2001). Water Code requires ecological concerns to be addressed (arts. 72–73). Groundwater and surface water to be considered to avoid adverse consequences resulting from allocation of a water right (art. 32).	
Water trading	Yes—lent or transferred with approval of Council (National Water Resources Board) (art. 19, Water Code).	
Drought provisions	<ul style="list-style-type: none">• Priority is generally given according to the time that right was established—“first in right, first in time”.• In emergencies, priority for domestic and municipal uses (art. 22, Water Code).• Water Crisis Management Committee established for monitoring.	
Organizational Setup (in relation to water rights)	National Water Resources Board	Coordinating body among water-related agencies with responsibility for water resources management, including licensing.
	National Economic and Development Authority	Coordinates development planning and policy formulation.
	Department of Environment and Natural Resources	Responsible for sustainable development of natural resources and ecosystems.
	National Irrigation Administration	Development and operation of public irrigation systems.

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Philippines: continued

	Twelve river basin organizations to be formed under the National Water Resources Board	Mandate for new river basin organizations being considered.
	Laguna Lake Development Authority	Responsible for developing and promoting balanced growth of Laguna Lake, including issuing water rights for aquaculture purpose; and for domestic and commercial uses.
Provisions for Participation/ Consultation	<p>Procedures to publicize license applications and provide opportunity for objections (art. 16, Water Code).</p> <p>Technical working groups established for representation of stakeholders in multipurpose dam projects.</p>	
Issues Raised Related to Water Rights and Allocation	<p>Institutional issues</p> <ul style="list-style-type: none"> • Limited link between spatial planning and water resources planning. • Limited resources in licensing body. <p>Context-specific issues</p> <ul style="list-style-type: none"> • Only 35% of uses are licensed. • Illegal abstractions. • Competing use among irrigation, urban water, and hydropower—conflict over allocation decisions and lack of compensation. 	

SRI LANKA		
Relevant water-related legislation, policy, and strategy	State Land Ordinance, 1947; Irrigation Ordinance, 1946 Mahaweli Authority of Sri Lanka Act, No. 23, 1979 Agrarian Services Act, revised 2000 Central Environment Authority Act, No. 47, 1980 Urban Development Act, No. 70, 1979 Local Government Act, No. 38, 1978; Disaster Management Act, 2005	
Basic Water Rights		
Legislated right to basic human needs	Not explicit in water-related legislation. Being considered in the process of developing new provisions.	
Customary rights	Not in water-related legislation. Customary rights exist and are generally recognized in practice (e.g., water-use rights in the ancient reservoirs, or “tanks”).	
Water-Use Rights (Allocation)		
Approach to allocating water-use rights	Administrative procedures involving seasonal operating plans and discussion among key stakeholders. Once agreement is reached, it is formalized in a seasonal pattern of water releases and recognized as an entitlement.	
Priority for allocation	None explicitly stated, but in practice water for drinking and domestic use takes precedence over other uses; followed by agriculture and hydropower, respectively.	
Status of licensing systems	None	
Environmental provision	There is no provision under the Environment Act or any other act in Sri Lanka, but it is being considered in the process of developing new provisions. At present, average dry weather flow is released in streams/rivers as minimum environmental flow and for environmental protection.	
Water trading	No	
Drought provisions	No preset priorities. In Mahaweli areas, a water panel of water users is established under the Mahaweli Authority of Sri Lanka. In non-Mahaweli areas, consultation for irrigation systems is undertaken by the district government agent with the project management committee and water users. Requirements of nonirrigation uses are also discussed and addressed in these water panel meetings and committees. Pertinent provisions under the Disaster Management Act of 2005.	
Organizational Setup (in relation to water rights)	Mahaweli Authority of Sri Lanka	Responsible for all Mahaweli areas under provisions of the Mahaweli Authority Act, No. 23 of 1979.
	Irrigation department	Planning, design, and operation of irrigation systems in non-Mahaweli areas, including implementation of water restrictions during drought conditions.
	District administrator	Responsible for all non-Mahaweli areas.
Provisions for Participation/ Consultation	See “Drought provisions.” The same water allocation mechanism is used to consider water demands for other sectors (e.g., industry and bulk urban supplies) during drought periods.	
Issues Raised Related to Water Rights and Allocation	Institutional issues <ul style="list-style-type: none">• Large number of water institutions with limited coordination.• Enforcement of existing laws is a problem; need to revise and consolidate legislation.• No well-defined priorities resulting to cross-sector issues. Context-specific issues <ul style="list-style-type: none">• Water quality concerns, particularly for groundwater.• Increasing competition for surface water from expanding urban areas.• Overall National Water Resources Master Plan that integrates sector plans has just been completed.• No incentive to save water or increase irrigation efficiency.• Poor implementation and enforcement of existing laws.	

THAILAND		
Relevant water-related legislation, policy, and strategy	1925, Civil and Commercial Code 1939, Private Irrigation Act 1942, Royal Irrigation Act 1977, Groundwater Act 2005, Draft Water Resources Act (prepared for consideration by Parliament)	
Basic Water Rights		
Legislated right to basic human needs	No legislated right of access. Draft Water Law recognizes three water classes (see following) and priorities of which small-scale uses do not require a license.	
Customary rights	Not in water-related legislation.	
Water-Use Rights (Allocation)		
Approach to allocating water-use rights	Currently a mixture of common access and administrative allocation through project or province. Everyone has an equal right to compete for water, provided it does not impinge on others. Article 7 of the draft Water Law embodies the principle of “no harm” for sanctioned uses. Licensing system would be established under draft Water Resources Act. Groundwater use requires a permit.	
Priority for allocation	Definition of three categories implies a priority of use (art. 10, draft Water Resources Act): <ul style="list-style-type: none">• living and household-related uses,• commercial agriculture, industry, hydropower, etc., and• larger or interbasin use.	
Status of licensing systems (if applicable)	None for surface water. Groundwater use needs a permit.	
Environmental provision	No formal requirement. Case-by-case decisions on water releases from reservoirs. The minister can stop water use if it causes damage to the environment. The National Water Resources Committee and river basin committees can allocate water for the environment.	
Water trading	Not for surface water. Groundwater permit is transferable.	
Drought provisions	In dry season only, priorities under draft Water Resources Act are <ul style="list-style-type: none">• water supply in cities and communities, including domestic consumption and industry,• agriculture using limited water,• salinity control,• second rice crop, and• water transport and sailing boats. In agriculture, priorities are <ul style="list-style-type: none">• marine animals and fishponds,• vegetable and fruit gardens,• field crops, and• dry season paddy rice.	
Organizational Setup (in relation to water rights)	National Water Resources Committee	Responsible for coordination across water agencies.
	Prime Minister’s Office of National Economic and Social Development Board	Responsible for including water in national development plans.

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Thailand: continued

	Ministry of Natural Resources and Environment	The Department of Water Resources monitors and sets policy and plans for national and river basin management. The Department of Groundwater issues permits for groundwater use. The Department of Pollution Control sets and monitors stream and effluent standards.
	Marine Department of the Ministry of Transport	Responsible for granting permission for any construction that intrudes into natural waterways, either to extract water in the river or for other purposes.
	Royal Irrigation Department of Ministry of Agriculture and Cooperatives	Responsible for providing water for agriculture and operating reservoirs and for sanctioning water from irrigation projects to other users (e.g., municipal, industrial).
	Electricity Generating Authority of Thailand	Development and operation of hydropower projects.
	29 river basin committees	Body of stakeholders. Now consulted on a request to use natural surface water.
Provisions for Participation/ Consultation	Basin committees established and consulted. Limited procedures for wider outreach. The composition of the basin committees is determined by the National Water Resources Committee and varies from one basin to another. Confirming the move toward decentralized water resources management, the draft Water Resources Act sets out the functions of the river basin committees, subriver basin committees, and water-user associations.	
Issues Raised Related to Water Rights and Allocation	<p>Institutional issues</p> <ul style="list-style-type: none"> Regulation of surface water is not currently undertaken by government agencies; conflicts are taken to court. Lack of explicit policy, legal, and institutional framework in basin areas. Coordination of river basin committees in cases where they are subbasins of a larger river basin (e.g., Chao Praya). <p>Context-specific issues</p> <ul style="list-style-type: none"> Increasing competition for water. Deteriorating water quality. Civil society opposition to large-scale water infrastructure. Overabstraction of groundwater in Bangkok. 	

VIET NAM		
Relevant water-related legislation, policy, and strategy	1998 Law on Water Resources No. 08/1998/QH10 2003 Decree No. 86/2003/ND/CP on river basin management 2004 Decree No. 149/2004/ND-CP on licensing 2006 National Water Resources Strategy (Prime Minister's Decision No. 81/2006/QĐ-TTg dated 14 April 2006)	
Basic Water Rights		
Legislated right to basic human needs	No absolute right defined for any water use.	
Customary rights	Not explicitly recognized under the Law on Water Resources.	
Water-Use Rights (Allocation)		
Approach to allocating water-use rights	Mixture of explicit licensing system and administrative allocation on project basis (e.g., irrigation).	
Priority for allocation	Ensures principle of equality, appropriateness, and prioritization order in terms of quantity and quality of domestic water (art. 20, Law on Water Resources). "Water exploitation and utilization for domestic consumption is given the first priority" (art. 22, Law on Water Resources).	
Status of licensing systems (if applicable)	Gradually being implemented. Ministry of Natural Resources and Environment is licensing authority at national level. Depending on the scale of the project, people's committees at provincial level. River Basin Organizations play an advisory role in the planning process. Licenses required for major government developments and private sector operations, 20 years for surface water and 15 years for groundwater.	
Environmental provision	Not in legislation. Ensuring minimum ecological flows is a requirement of the National Water Resources Strategy (pt. 2 s.2.2[a][2] and pt. 3 s1.1[d]).	
Water trading	Not permitted under the Law on Water Resources.	
Drought provisions	Priority uses are stipulated in art. 20, Law on Water Resources. Decree No. 179/1999/ND-CP gives following priority during drought: <ul style="list-style-type: none">• daily life,• water for cattle and poultry rearing and aquatic and marine product culture,• important industrial establishments and scientific research institutions,• food security and crops of high economic value, and• other water exploitation and use purposes.	
Organizational Setup (in relation to water rights)	National Council on Water Resources	Responsible for policy development and interministerial coordination.
	Ministry of Natural Resources and Environment	Responsible for water resources management at the national level and licensing transferred to the Ministry of Natural Resources and Environment from the Ministry of Agriculture and Rural Development in 2002.
	Ministry of Agriculture and Rural Development	Responsible for irrigation development and flood management. Also retained responsibility for river basin management, although this was recently transferred to the Ministry of Natural Resources and Environment under the prime minister's decision.
	Provincial departments of natural resources and environment	Responsible for advising provincial people's committees on water licensing.
	River basin organizations	Future role in water resources planning, but not yet effective.
	Provincial peoples committees	Responsible for water licensing.

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Viet Nam: continued

	Electricity of Viet Nam, Ministry of Industry	Responsible for development of hydropower projects.
	Electricity Regulatory Authority of Viet Nam	Established in 2005 to regulate the electricity market and activities, including hydropower.
Provisions for Participation and Consultation	Mainly through the formal political and administrative structures at provincial, district and commune levels. Councils have been formed for consideration of water-use applications.	
Issues Raised Related to Water Rights and Allocation	<p>Institutional issues</p> <ul style="list-style-type: none"> • Lack of secondary legislation and technical guidance for implementing water rights allocation. • Low levels of coordination among organizations. • Institutional uncertainty for river basin management. • Water law currently being updated. <p>Context-specific issues</p> <ul style="list-style-type: none"> • Deteriorating water quality affecting water availability. • Increasing competition for water because of economic growth and increase in per capita consumption. • Increasing importance of cooperation on international rivers and on interprovincial distribution for irrigation. • Increasing prevalence of natural disasters. 	

Appendix 3: Participants of the Network of Asian River Basin Organizations Workshop on Water Rights and the Four Thematic Workshops on Water Rights and Allocation

Asian Development Bank Headquarters, Manila

29–31 May 2007

WORKSHOP TEAM

Wouter Lincklaen Arriens (workshop leader and moderator)

Jeremy Bird (water-law specialist)

Ian Makin (resource person)

Dennis von Custodio (resource person)

Michitaro Nakai (resource person)

List of Participants					
No	Name	Country	Organization	Job-Title	E-mail
1	Le Van Hoc	Viet Nam	Institute of Water Resources Planning - Red River Basin Organization	Deputy Director	iwrp.hanoi@hn.vnn.vn
2	Bui Nam Sach	Viet Nam	Institute of Water Resources Planning - Red River Basin Organization	Deputy Head, Division for Water Resources Planning for North Region	sachbuinam@fpt.vn
3	Dang Thi Lan Huong	Viet Nam	Ministry of Natural Resources and Environment	Head, Surface Water Management Bureau	dlhuong_tnn@yahoo.com
4	Ramon Alikpala	Philippines	National Water Resources Board	Executive Director	rbalikpala@gmail.com
5	Elenito Bagalihog	Philippines	National Water Resources Board	Chief, Water Rights Division	elenitob@yahoo.com
6	Jocelyn Siapno	Philippines	Laguna Lake Development Authority	Project Development Officer III	jsiapno42@yahoo.com
7	Vicente B. Tuddao Jr	Philippines	Department of Environment and Natural Resources	Director	vbtuddaojr@yahoo.com
8	Milo Landicho	Philippines	National Irrigation Administration	Manager, Water Resources Utilization Division	milo_landicho@yahoo.com
9	Leslie C. Dizon	Philippines	National Irrigation Administration	Supervising Researcher Analyst	lesliecdizon@yahoo.com
10	Amnat Wongbandit	Thailand	Thammasart University	tbd	awongban@yahoo.com
11	Phonechaleun Nonthaxay	Lao People's Democratic Republic	Water Resources Coordination Committee Secretariat	Director General	nonthaxay@yahoo.com
12	Phalasack Pheddara	Lao People's Democratic Republic	Planning and Cooperation Division, Department of Irrigation, MAF	Director	picco@laotel.com; phalasack@hotmail.com

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List of Participants: continued

List of Participants					
No	Name	Country	Organization	Job-Title	E-mail
13	Ivan de Silva (NARBO Vice Chair)	Sri Lanka	Mahaweli Authority of Sri Lanka	Director General	mahaweli@eureka.lk
14	Sudharma Elakanda	Sri Lanka	Mahaweli Authority of Sri Lanka	Project Director	elamrrp@sltnet.lk
15	Basuki Hadimuljono (NARBO Chair)	Indonesia	Agency of Research & Development, Ministry of Public Works	Director General	kabalitbang@pu.go.id
16	Herman Idrus	Indonesia	Jasa Tirta II Public Corporation	Head of Research & Development Bureau	litbang@jasatirta2.co.id
17	Mudjiadi	Indonesia	Balai Besar Citarum Basin	Head of Balai Besar	mudjiadi@yahoo.co.id
18	Donny Azdan	Indonesia	BAPPENAS	Director, Water Resources and Irrigation	dmazdan@bappenas.go.id
19	Soekotjo Tri Sulistyio	Indonesia	Balai Besar Citarum	Chief of Sector for Implementation Water Resources System Development	mudjiadi@yahoo.co.id
20	Sulad Sriharto	Indonesia	Ministry of Public Works	Chief of Sub Directorate for Operation and Maintenance of Rivers, Lakes and Reservoirs	sl_sriharto@hotmail.com
21	Arlene Inocencio	Malaysia	IWMI	Economist	a.inocencio@cgiar.org
22	Michio Ota	Japan	Japan Water Agency	Director, International Affairs Division	michio_oota@water.go.jp
23	Shinobu Ifuji	Japan	Japan Water Agency	Administrator, International Affairs Division	shinobu_ifuji@water.go.jp
24	Michitaro Nakai	Japan	Asian Development Bank Institute	NARBO Associate	mnakai@adbi.org
25	Yoshio Tokunaga	Japan	Flood Control and Sabo Engineering Center, Department of Public Works and Highways	JICA Expert (Chief Advisor)	tokunaga-y2ag@nifty.com
26	Wouter Lincklaen Arriens	Philippines	Asian Development Bank	Lead Water Resources Specialist	wlincklaenarriens@adb.org
27	Chris Morris	Philippines	Asian Development Bank	Senior Water Resources Engineer	cmorris@adb.org
28	Ian Makin	Philippines	Asian Development Bank	Water Resources Engineer	imakin@adb.org
29	Jeremy Bird	Philippines	Asian Development Bank	Consultant	jeremy.bird@tiscali.co.uk
30	Dennis Von Custodio	Philippines	Asian Development Bank	Consultant	dvcustodio@adb.org

FOUR NARBO THEMATIC WORKSHOPS ON WATER RIGHTS AND WATER ALLOCATION

Core Group of Specialists

1. Elenito Bagalihog (Philippines)
2. Jocelyn Siapno (Philippines)
3. Sukontha Aekaraj (Thailand)
4. Kobkiat Pongput (Thailand)
5. Bambang Hargono (Indonesia)
6. Herman Idrus (Indonesia)
7. Kingkham Manivong (Lao People's Democratic Republic)
8. Le Van Hoc (Viet Nam)
9. Bui Nam Sach (Viet Nam)
10. Sudharma Elakanda (Sri Lanka)
11. W. A. Chandrapala (Sri Lanka)

NARBO

1. Michitaro Nakai (Asian Development Bank Institute)
2. Hiroyuki Shindou (Japan Water Agency)
3. Minoru Arai (Japan Water Agency)
4. Dennis Von Custodio (Asian Development Bank)
5. Francisco Roble (Asian Development Bank)

Workshop 1: Ha Noi, Viet Nam, 5–9 December 2005

Outcome: Water rights and allocation issues identified, shared, and confirmed

The workshop took stock of the issues and status of water rights, water allocation, and drought management in participants' respective countries, drawing from country reports and presentations by the participants. To Trung Nghia of the Ministry of Agriculture and Rural Development introduced the role and functions of the Red River Basin Organization. Ian Fox of the Asian Development Bank's Viet Nam Resident Mission gave a presentation on "Understanding Water Rights and Water Allocation." Study visits were held at the (i) Hoa Binh Hydropower Plant and Multi-Purpose Dam, whose waters are used for power generation, irrigation, fisheries, flood management, and water transport; and (ii) Thac Huong Dam, whose waters are used for irrigation, flood management, and navigation. The host organizations were the Red River Basin Organization and Ministry of Agriculture and Rural Development.

List of Participants for Workshop 1

No	Name	Country	Organization	Job-Title	E-mail
1	Pham Hong Giang	Viet Nam	Ministry of Agriculture and Rural Development (MARD)	Vice Minister	
2	To Trung Nghia	Viet Nam	Institute of Water Resources Planning	Director	iwrp.hanoi@vnn.vn
3	Le van Hoc	Viet Nam	Institute of Water Resources Planning	Deputy Director	iwrp.hanoi@vnn.vn
4	Su Pham Xuan	Viet Nam	Department of Water Resources, MARD	General Director, Head of General Office for River Basin Organization in Viet Nam	rbovn.tl@mard.gov.vn
5	Thuan Le Huu	Viet Nam	Department of Water Resources Management, Ministry of Natural Resources and Environment (MONRE)	Head of Bureau	nwrc@hn.vnn.vn
6	Trong Thuan Ngo	Viet Nam	MONRE		
7	Nguyen Anh Minh	Viet Nam	MARD	Expert	
8	Nguyen T Tuyet Hoa	Viet Nam	MARD	Deputy Director	
9	Pham Xuan Phuong	Viet Nam	Sub-Institute for Water Resources Planning	Cuu Long River Basin Office	pvqhtlnambo@hcfpt.vn

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List of Participants: continued

List of Participants for Workshop 1					
No	Name	Country	Organization	Job-Title	E-mail
10	Phong Nguyen Xuan	Viet Nam	Dongnai River Basin Organization Office, Sub-Institute for Water Resources Planning	Engineer of Water Resources Planning	dnrbo@yahoo.com
11	Tac Nguyen Van	Viet Nam	Bac Giang DARD, Bac Giang Province	Deputy Director	tacnv@yahoo.co.uk
12	Dinh Khac Tinh	Viet Nam	Thai Nguyen DARD	Deputy Director	quyensonntn@gmail.com
13	Quach Tu Hai	Viet Nam	Hoa Binh Water Resources Sub-Department, Hoa Binh Province	Director	
14	Tran Dung Thanh	Viet Nam	Department of Natural Resources and Environment, Dong Nai Province	Deputy Head of Water Resources and Mineral Management	
15	Nguyen Van Sinh	Viet Nam	Department of Water Resources, MARD		rbovn.tl@mard.gov.vn

Workshop 2: Quezon City, Philippines, 5–9 June 2006

Outcome: Causes of water rights and allocation issues analyzed

The workshop analyzed issues surrounding water rights and allocation and their causes, and drafted preliminary plans to address these issues. The issues and causes included input from the respective participants' organizations, based on internal discussions following the first workshop. Kouji Nukina of Japan's Ministry of Land Infrastructure and Transportation gave a presentation on Japan's

water resources policy, and Michitaro Nakai of the Asian Development Bank Institute gave a presentation on Japan's experience of approaching water allocation challenges. Study visits were held at the (i) Kalayaan Pumped Storage Power Plant in Muntinlupa City, whose primary water source in generating hydroelectric power is Laguna Lake; and (ii) Angat Dam and Reservoir in Bulacan Province, whose waters are used for domestic purposes, irrigation, flood control, and power generation. The host organizations were the National Water Resources Board and the Laguna Lake Development Authority.

List of Participants for Workshop 2				
No	Name	Country	Organization	Designation
1	Evelyn V. Ayson	Philippines	Water Rights Division, National Water Resources Board	Chief
2	Eleanor Manalo	Philippines	Environmental Management Bureau, Department of Environment and Natural Resources (DENR)	Senior Environmental Management Specialist
3	Emmie L. Ruales	Philippines	Policy and Program Division, National Water Resources Board	Project Development Officer III
4	Virgilio dela Cruz	Philippines	Agusan River Basin Project, DENR	Chair, Technical Working Group
5	Eduardo L. Torres	Philippines	Legal Division	Chief
6	Jacqueline N. Davo	Philippines	Lake Management Division	Officer-in-Charge
7	Cesar R. Quintos	Philippines	Project Planning and Development Division	Officer-in-Charge
8	Alicia E. Bongco	Philippines	Integrated Water Resources Management Division	Chief

Workshop 3: Bangkok, Thailand, 27 November–1 December 2006

Outcome: Results of first and second workshops reviewed, and approaches to improvement identified

The workshop reviewed issues on water rights and allocation, their causes, and preliminary plans to address these issues. Masayuki Sato of Japan's Ministry of Land, Infrastructure and Transport gave a presentation on groundwater management, and Michitaro Nakai of the Asian

Development Bank Institute gave a presentation on the Japan River Law. Study visits were held at the (i) Bang Pakong River Basin in Prachin Buri Province (where participants discussed with the Bang Pakong River Basin Committee the water evaluation and planning model for water allocation of the basin); and (ii) Khlong Tha Dan Dam in Nakhon Nayok Province (an irrigation, water supply, and flood control project). The host organization was Thailand's Department of Water Resources, Ministry of Natural Resources and Environment.

List of Participants for Workshop 3					
No	Name	Country	Organization	Designation	E-mail
1	Siripong Hungspreug	Thailand	Department of Water Resources	Director General	
2	San Kemprasit	Thailand	Department of Water Resources	Chief Engineer	
3	Surapol Pattanee	Thailand	Department of Water Resources	Director, Bureau of Water Resources Policy and Planning	surapol_2001@hotmail.com
4	Worasart Apaipong	Thailand	Department of Water Resources	Director, Bureau of Water Resources Conservation and Rehabilitation	apaipong_w@hotmail.com
5	Wittaya Polprapai	Thailand	Department of Water Resources	Director, Promotion and Management in Basin Division	
6	Suthep Tangsup	Thailand	Department of Water Resources	Senior Engineer, Bureau of Research Development and Hydrology	sutheo_tangsup@hotmail.com
7	Charlemsak Tancharoen	Thailand	Department of Water Resources	Plan and Policy Analyst, Bureau of Water Management	Charlemsak_t@yahoo.com
8	Supon Sodsoon	Thailand	Department of Water Resources	Plan and Policy Analyst, Bureau of Water Management	
9	Jittima Theinmittrapap	Thailand	Department of Water Resources	Senior Lawyer, Legal Affairs Group	jit_lawyer@hotmail.com
10	Piriya Uraiwong	Thailand	Department of Water Resources	Civil Engineer, Bureau of Water Resources Development	
11	Pongsthakorn Suvapimol	Thailand	Royal Irrigation Department	Expert on Hydrology	chanchai@mail.rid.go.th
12	Pongsak Arulvijitskul	Thailand	Royal Irrigation Department	Chief of Water Management	pongsak@mail.rid.go.th
13	Chaiyong KhongKhaudom	Thailand	Department of Groundwater Resources	Geologist	chaiyong@drg.go.th
14	Kobkiat Pongput	Thailand	Water Resources Engineering Department, Kasetsart University	Associate Professor	Kobkiat.p@ku.ac.th

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List of Participants: continued

List of Participants for Workshop 3					
No	Name	Country	Organization	Designation	E-mail
15	Jaroensuk Worapansopak	Thailand	Eastern Water Resources Development and Management PLC	Vice President, Project Planning Department	Jaroensuk@eastwater.com
16	Sanguan Maneeanantasap	Thailand	The Electricity Generating Authority of Thailand	Head, Water Resources Information Section, Water Resources Management Department	sanguan.m@egat.co.th

Workshop 4: Saitama, Japan, 22–27 January 2007

Outcome: Action plan to address water rights and allocation issues drafted

The workshop drafted action plans to address water rights and water allocation challenges in each of the participating countries. The action plans drew input from the participants' respective organizations based on internal discussions after

the previous workshop. Professor Tsuneaki Yoshida of Tokyo University gave a special lecture on improving water issues based on Japan's Aichi Canal experience. Study visits were held at the (i) Tone Canal in Gyoda City, Saitama Prefecture; (ii) Kasumigaura Lake in Inasiki City, Ibaraki Prefecture; and (iii) Chiba Canal in Yachiyo City, Chiba Prefecture. The host organization was the Japan Water Agency.

List of Participants for Workshop 4					
No	Name	Country	Organization	Designation	E-mail
1	Elenito Bagalihog	Philippines	National Water Resources Board	Chief, Water Rights Division	elenitob@yahoo.com
2	Jocelyn Siapno	Philippines	Laguna Lake Development Authority	Project Development Officer III	josiapno@yahoo.com
3	Sukontha Aekaraj	Thailand	Department of Water Resources, Ministry of Natural Resources and Environment	Director, Foreign Relation and International Cooperation Division	s.aekaraj@gmail.com
4	Kobkiat Pongput	Thailand	Water Resources Engineering Department, Kasetsart University	Associate Professor	Kobkiat.p@ku.ac.th
5	Herman Idrus	Indonesia	Jasa Tirta II Public Corporation	Head of Research and Development Bureau	litbang@jasatirta2.co.id
6	Kingkham Manivong	Lao People's Democratic Republic	Water Resources Coordination Committee Secretariat	Technical Policy and Legislation Unit	kingkham@hotmail.com
7	Le Van Hoc	Viet Nam	Deputy Director, Institute of Water Resources Planning; Deputy Chief, Red River Basin Organization	Institute of Water Resources Planning; Red River Basin Organization	iwrp.hanoi@hn.vnn.vn
8	Bui Nam Sach	Viet Nam	Deputy Head, Division for Water Resources Planning for the Northern Region	Institute of Water Resources Planning	sachbuinam@fpt.vn
9	Sudharma Elakanda	Sri Lanka	Project Director	Mahaweli Authority of Sri Lanka	elamrrp@sltnet.lk

Appendix 4: Highlights of Workshop Session on Addressing Issues and Challenges in Water Rights and Water Allocation, 3rd Network of Asian River Basin Organizations General Meeting, Indonesia, February 2008

WORKSHOP 3: EXPLORING NEW CHALLENGES IN INTEGRATED WATER RESOURCES MANAGEMENT

Workshop Session on Addressing Issues and Challenges in Water Rights and Water Allocation
21 February 2008, 13:00–14:30

The workshop helped participants to increase their understanding of the principles and application of water rights and water allocation, including challenges, practical solutions, and lessons in the implementation of water rights. The session was chaired by the Network of Asian River Basin Organizations' (NARBO) vice chair, Ivan de Silva. The Asian Development Bank's (ADB) Wouter Lincklaen Arriens presented the initial draft version of this technical paper prepared for NARBO on water rights and allocation. After clarifying questions, ADB's Ian Makin facilitated a question-and-answer session with the panelists and discussion with the participants.

CHAIR:

Ivan de Silva (Mahaweli Authority of Sri Lanka):
NARBO Vice Chair

RESOURCE PERSONS:

1. Wouter Lincklaen Arriens (ADB): Presenter
2. Ian Makin (ADB): Facilitator

PANELISTS:

1. Le Tuan Nguyen, Ministry of Natural Resources and Environment, Viet Nam
2. Elenito Bagalihog, National Water Resources Board, Philippines
3. Sukontha Aekaraj, Ministry of Natural Resources and Environment, Thailand
4. Sudharma Elakanda, Mahaweli Authority of Sri Lanka
5. Michitaro Nakai, Japan Water Agency
6. Herman Idrus, Perum Jasa Tirta II, Citarum River Basin, Indonesia
7. Rustam Abdukayumov, ADB Resident Mission in Uzbekistan
8. Sun Feng, Yellow River Conservancy Commission, People's Republic of China

FACILITATED DISCUSSION WITH PANELISTS

1. Le Tuan Nguyen, Ministry of Natural Resources and Environment, Viet Nam

Question: Plans to implement integrated water resources management and river basin management have a high priority in Viet Nam. Is your government already piloting an explicit system of water allocation as part of these reforms?

Response: Viet Nam has a system for water allocation and water rights that is provided by the Law on Water Resources of 1998. The country also has a licensing system for water extraction (surface water and groundwater) and water discharge, at central as well as provincial levels, depending on the scale of water extraction or

wastewater discharge. However, the existing Law on Water Resources has some constraints in view of pending reforms in water resources management, including the respective roles of the Ministry of Natural Resources and Environment, Ministry of Agriculture and Rural Development, Ministry of Industry and Trade, and other ministries. Thus, it has been decided to revise the Law on Water Resources with coordination led by the Ministry of Natural Resources and Environment. Water allocation has no problems at the policy level, but it is not easy with respect to implementation. In order to improve the effectiveness of the system, the government gives high priority to incorporating water allocation and river basin management under the umbrella of integrated water resources management. The final draft decree on river basin management, with focus on the river basin planning process, river basin organization (RBO) arrangement, and clarifying institutional setup with clear tasks and obligations of stakeholders and state agencies in river basin management, has been submitted to the government for public consultation.

2. Elenito Bagalihog, National Water Resources Board, Philippines

Question: The Philippine Water Code has been a pioneer of modern water legislation in the region. However, implementation of the licensing system has been slow. Can you tell us three measures that the government is taking to accelerate implementation of the licensing system?

Response: The National Water Resources Board has adopted a platform for action to improve integrated water resources management. Localization of integrated water resources management is already ongoing, which creates integrated water resources management boards that will manage water resources at the provincial level. A demand-driven strategy is being implemented to establish ownership and to address sustainability. An informational, educational, and communication campaign is being strengthened. Laws, rules and regulations, and policies related to water rights system, including primers on the processing of water permit applications, have been

posted at the National Water Resources Board website (www.nwrb.gov.ph) for easy download. Seminars, workshops, and education campaigns have started in some areas. Intensive monitoring and enforcement activities are being undertaken through the issuance of cease-and-desist orders and imposition of fines and penalties against illegal water users. Filing of criminal cases against violators is being considered.

3. Sukontha Aekaraj, Ministry of Natural Resources and Environment, Thailand

Question: Thailand has established more than 25 river basin committees over the past 10 years. What roles do you see these committees playing in water allocation by 2015, 7 years from now?

Response: In the coming years, river basin committees in Thailand are expected to take a more active part in (i) developing water allocation models; (ii) pilot-testing with stakeholders' scenarios of water allocation where water is abundant, where water availability is normal, and where water is scarce; and (iii) establishing rules and regulations of water allocation. Even without the water law, river basin committees can promote their roles on annual water allocation and permits for use of large volumes of water with the agreement of all stakeholders through the social learning process. River basin committees are expected to provide the forum for stakeholder participation, particularly in formulating the rules and regulations on water allocation, and monitoring. The Bang Pakong River Basin is the pilot basin that the river basin committee has promoted to take part in the above process and with activities that focus on (i) preparing communities to be ready for collaboration, (ii) web services for data collection, (iii) installing necessary equipment, and (iv) public sector and community capacity building. Monitoring and evaluation are also being implemented.

4. Sudharma Elakanda, Mahaweli Authority of Sri Lanka

Question: The Mahaweli Authority of Sri Lanka has a long history of allocating water from the

main river to various parts of the country. With further economic development and climate change, how do you see the role of your RBO in water allocation changing between now and 2015?

Response: Currently, the Mahaweli Authority of Sri Lanka has a mandate for bulk water allocation through the Water Management Secretariat. Water allocation is done for irrigation, hydropower, and domestic water uses. A seasonal operation plan is jointly prepared by stakeholders and is approved at a water panel held biannually. Water allocation is monitored weekly and carried out by the respective stakeholders. On future challenges, the government has identified the following barriers that need to be overcome: (i) the lack of an existing master plan for water use, (ii) each sector lobbying for highest priority, (iii) a power sector still largely dependent on hydropower, and (iv) sectors' interdependent nature negatively affecting the management of water allocation. The government has already undertaken the following actions: (i) under the World Bank-assisted Dam Safety and Water Resources Planning Project, a national water-use master plan is expected to be developed, whereby all sector plans will be incorporated into a water-use plan for appropriate and effective water allocation; (ii) initiated power sector plans that, among others, identify other viable options moving away from hydropower (e.g., a 900 megawatt coal power plant); and (iii) strengthened mechanisms to elicit higher participation from stakeholders.

5. Michitaro Nakai, Japan Water Agency

Question: Japan has a robust river law that builds on a long history of customary water-use rights. The law has helped Japan manage its water resources during rapid economic development. However, pressures on water resources continue, a recent example being the drought conditions on Kyushu Island. Do you think Japan's system of water rights and allocation is adequate for that challenge or does it need further change? And if so, what needs to change?

Response: Japan's system of water rights and water allocation is currently adequate to face challenges on water resources management. Japan

has a good water rights system. There is balance on water allocated between new water users and old water users at the river basin level. Stakeholder participation is adequately practiced, with drought conciliation councils working well in coordinating water users. There are no special problems on the current system; thus there is no specific reason to revise. One controversial point, though, is that under the Japanese river law, transfer of water rights is strictly restricted, which faced different opinions from some sectors. Another point of argument is the introduction of the water market system.

6. Herman Idrus, Perum Jasa Tirta II, Citarum River Basin, Indonesia

Question: Indonesia has much experience with RBOs with corporate models, with very good results. Over the past year, the government has established many more RBOs with a public service model to help implement the water resources law. What mandate do these existing and new organizations have to introduce an explicit water allocation system with licenses?

Response: An RBO with a corporate model was applied in Indonesia in 1967, prior to Government Law No. 11/1974 (now replaced by the new Law on Water Resources No. 7/2004). The corporate model RBO generates revenues from raw water services in order to provide funds for operation and maintenance of water resources infrastructure. The tariffs and contributions from water users are determined fully by local governments but are not sufficient to cover the required budgets. The new law has not been followed by the corresponding implementing rules and regulations. Based on the former existing rules and regulations, water allocation is prioritized according to the following: first priority is given to domestic, municipal, and industry water uses; next priority is given to irrigation and agriculture; which is then followed by hydropower and others. The established corporate model RBO was given the authority to generate revenue by providing services to the beneficiaries, including electricity, raw water supply, tourism, etc. Under the new law, RBOs are established with public service models. Newly

established RBOs have responsibilities for several aspects of water resources management in the river basin, except for revenue-generating activities.

7. Rustam Abdukayumov, Asian Development Bank Resident Mission in Uzbekistan

Question: In all of the subregions in Asia, Central Asia has the highest degree of water utilization, and countries are already collaborating in managing their shared rivers. Kazakhstan and the Kyrgyz Republic are sharing the waters of the Chu and Talas rivers and have recently established an international RBO for this purpose. Was competition for water the main reason? And do these two countries have similar legal and institutional arrangements for water rights and allocation?

Response: The main reason for establishing the international RBO is to ensure more transparent and timely water allocation. Kazakhstan initiated the establishment of the RBO because it is fully dependent on water release from the Kyrgyz Republic, i.e., the water source of both Chu and Talas rivers. Timely water allocation can be ensured only if there is adequate financing for operation and maintenance. Because both water reservoirs are located in the Kyrgyz Republic, which cannot afford full operation and maintenance, Kazakhstan agreed to share the costs. In 2000, an interstate agreement on water allocation in the Chu and Talas basins was signed, and the RBO was established in 2006 with ADB support. Both countries use 1983 regulations for the two rivers, prepared by the Ministry of Agriculture and Water Resources of the former Soviet Union as a guiding document for water allocation. But the challenge is to provide adequate financing for operation and maintenance so that reservoirs are well maintained and can store the required volume of water.

8. Sun Feng, Yellow River Conservancy Commission, People's Republic of China

Question: As the world's largest RBO, the Yellow River Conservancy Commission allocates water

between nine provinces to ensure that demands are met and that the river does not run dry. You have had major successes over the past years. Have you now solved your problems? Please tell us three goals that the Yellow River Conservancy Commission can reach in the coming 10 years to continue its success.

Response: The Yellow River is the second-largest river in the People's Republic of China and is regarded as the "Mother River of China." It has bred Chinese civilization for 5,000 years. In recent decades, water scarcity has become more severe in view of climate change, population growth, industrialization, and urbanization. In the 1990s, the Yellow River was frequently running dry. In 1997, the Yellow River ran dry for 226 days, which caused economic losses, paralyzed industry and agriculture, and degraded the ecosystem. The government called for concrete actions. In 1999, the Yellow River Conservancy Commission was authorized to create the Water Allocation Department to implement integrated water allocation in the Yellow River Basin. In August 2006, the commission formulated the regulation of water allocation in the basin. The commission will continue to enact the following measures on water allocation for the Yellow River Basin: (i) further strengthen enforcement of laws and regulations (the commission issued relevant regulations to provide an enabling legislative environment and to continue to implement water abstraction permit licenses in the basin); (ii) further strengthen water governance through an integrated water resources management approach in the basin (the commission has established a yearly, monthly, and 10-day water allocation system; water allocation consulting system; and sediment flushing to protect the river ecosystem); and (iii) encourage water-saving to create harmony between people and nature. Meanwhile, the commission is planning to implement a water transfer project from south to north to alleviate the water shortage situation in the Yellow River Basin and the northern part of the People's Republic of China.

PLENARY DISCUSSION

Md. Gholam Mustafa Patwary, Local Government Engineering Department, Bangladesh, commented on the difficulty of implementing water rights and water allocation system for the Ganges River Basin, a transboundary basin covering India (upstream) and Bangladesh (downstream). Because of the shortage of water in the dry season, the government cannot implement properly the Ganges–Kobadak project (RBO-related), which plays an important role in the agriculture sector of Bangladesh.

Vishal Gagan, Orissa State Government, India, commented that in India, there are government committees looking into water allocation. Besides the national water policy, every state has its own policy because water is a state subject. Thus, the state of Orissa has its own policy that was amended in 2007. Conflicts on water allocation are arising, and there is a need to strengthen water governance, including information, education, and communication campaigns. The government of Orissa intends to demonstrate the formation of a RBO in the Baitarani River Basin (to be supported by ADB).

Le Duc Nam, Ministry of Agriculture and Rural Development, Viet Nam, commented that eight RBOs have been established in Viet Nam, and that river basin planning, including water allocation, is undertaken at different levels. Wastewater discharge needs more attention, and there are still overlapping responsibilities in the existing water resources law and river basin decree.

Jaya Chatterji of ADB's India Resident Mission commented that once water allocation is done, relevant information should be shared with media. Water allocation could be supported by memoranda of understanding among governments and the different water-using sectors. This could also consider minimal and regular flows in water allocation. She also saw a need to strengthen community-based institutions so they can better assert their rights. Civil society could help by developing independent monitoring units. Generally, she argued that water use should be charged, and that optimal use should be made of technology to improve water-use efficiency. She also suggested that NARBO consider the reduction of conflicts over water as an impact indicator.

Water Rights and Water Allocation: Issues and Challenges for Asia

As governments across Asia are searching for ways to increase water security for rural and urban water uses, the need to articulate water rights and improve water allocation practices is rapidly becoming a priority issue to them. The process is made more complex by rapid urbanization, climate change, and other drivers of change. With the support of the Network of Asian River Basin Organizations (NARBO), practitioners are discovering what role they can play in avoiding and solving problems among stakeholders, and in building an enabling environment for integrated water resources management in river basins.

About the Asian Development Bank

ADB's vision is an Asia and Pacific region free of poverty. Its mission is to help its developing member countries substantially reduce poverty and improve the quality of life of their people. Despite the region's many successes, it remains home to two-thirds of the world's poor: 1.8 billion people who live on less than \$2 a day, with 903 million struggling on less than \$1.25 a day. ADB is committed to reducing poverty through inclusive economic growth, environmentally sustainable growth, and regional integration.

Based in Manila, ADB is owned by 67 members, including 48 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.

For inquiries, please contact water@adb.org